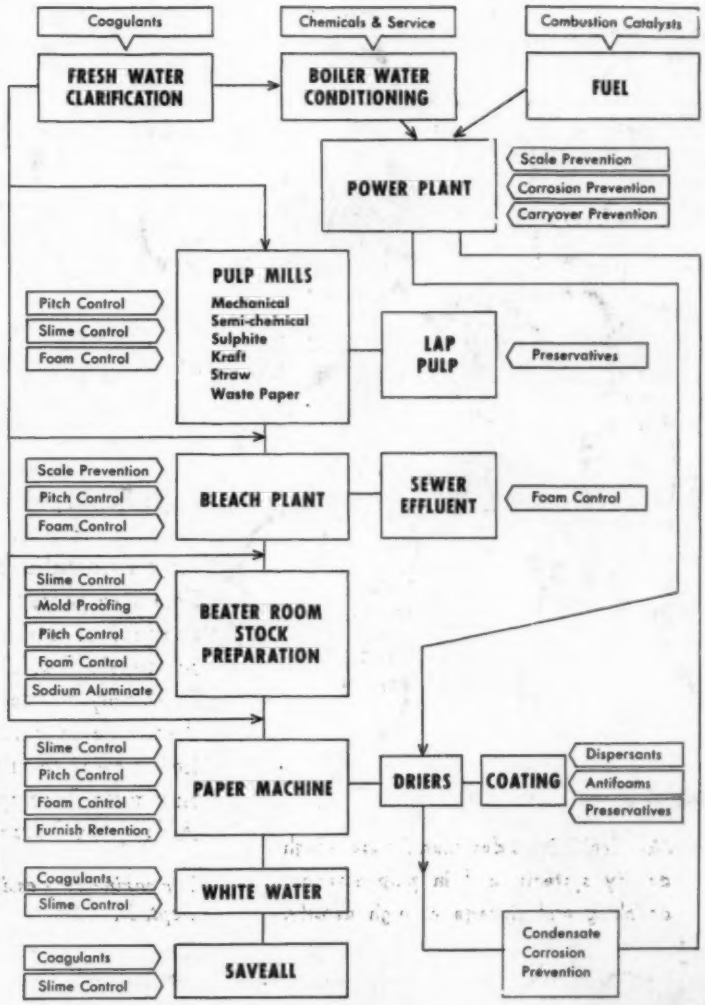
The

CHART of Nalco®

PRODUCTS and SERVICES for the PAPER INDUSTRY

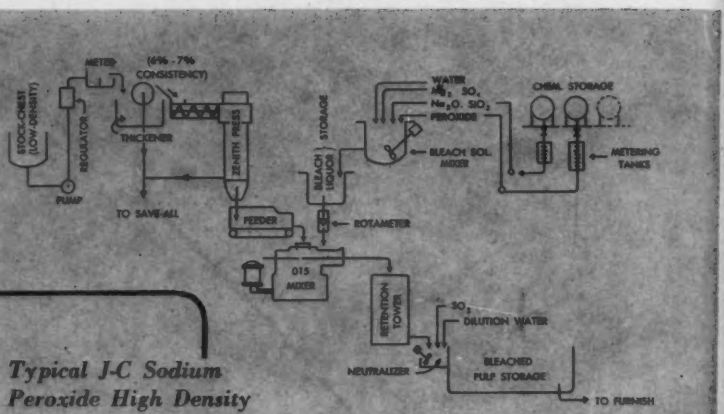


FROM raw water through final recovery, Nalco chemicals and services help produce better pulp and paper products...speed processing...save time and money. Details on the chemicals and services outlined here are contained in Nalco Bulletin 55. Write for your copy today—or ask your Nalco Representative for answers to your problems.

NATIONAL ALUMINATE CORPORATION
6232 West 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

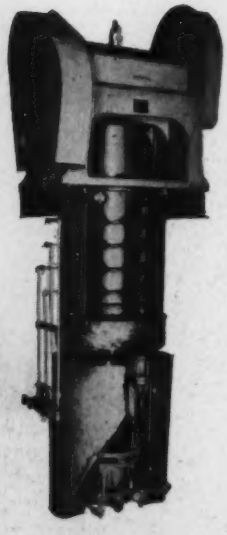
THE *Nalco* SYSTEM • Serving the Paper Industry through Practical Applied Science

Jackson and Church — HIGH DENSITY SYSTEM



Typical J-C Sodium Peroxide High Density Bleaching System

USES *NO MORE* PEROXIDE TO BLEACH *HIGHER* TONNAGE TO *SAME* BRIGHTNESS OR— *SAME* TONNAGE TO *HIGHER* BRIGHTNESS



*Patents applied for J&C Copyright

J&C Zenith Press designed for use in high density systems, and in pulp washing, de-inking and storage at high density.

The J&C High Density System makes possible bleach consumption savings up to 25%

HERE ARE ADDITIONAL ADVANTAGES:

High density—40% or higher
Continuous operation
Fully automatic operation
Selective pressure control
Product of uniform consistency
Moderate first cost
Extremely rugged construction
Available in corrosion resistant alloys
Low power requirement
Minimum floor space
Aids good housekeeping

For engineering assistance and actual mill performance data, write Dept. D.

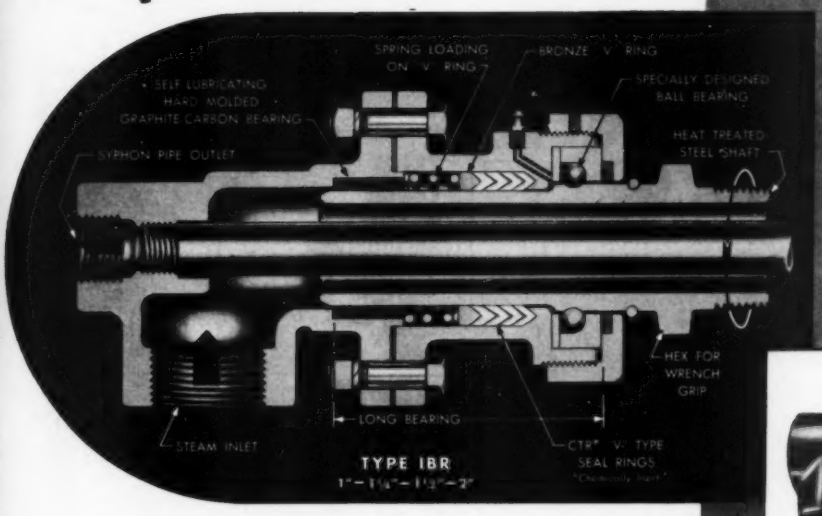
JACKSON & CHURCH COMPANY · SAGINAW, MICHIGAN

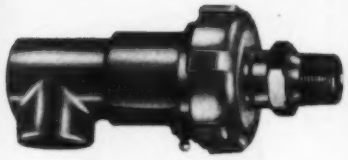
Better Temperature Control

THE IMPROVED

BARCO

REVOLVING JOINT





TYPE IBRSA
½"—¾"

For Paper Machine Dryers, Calenders, Paper Converting Equipment

■ Operating engineers throughout the country are reporting the benefits they receive from Barco's new *improved* Type IBR Revolving Joints. These are benefits that come from the *correctness* of Barco's design. There is minimum increase in torque (friction) under increased steam pressure—thanks to Barco's exclusive "CTR" V-type seal rings and ball bearings. Also note the wide spacing between bearings which holds bearing loads and wear to a minimum.

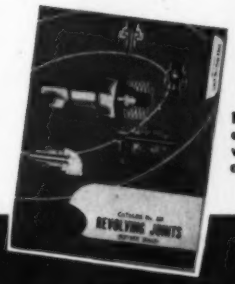
- **Better Temperature Control where steam is used for heating rolls due to better circulation.**
- **Free-Floating, Low Torque Installations.**
- **Up to 50% Power Savings.**
- **Exclusive "CTR" V-Type Seal Rings—*chemically inert.***
- **Ability to Withstand Vibration and Hard Usage.**
- **Low Maintenance; No Adjusting. Holds seal running or standing.**

Barco builds a complete line of standard revolving joints in sizes ranging from ½" to 2" and special in sizes to 5". Pressures to 250 psi, steam, or 1000 psi, hydraulic. Speeds to 2500 rpm. *Barco Engineers are at your service; ask for recommendations.*

BARCO MANUFACTURING CO.
1826F Winnemac Ave., Chicago 40, Illinois
In Canada: The Holden Co., Ltd.

Syphon Style—TYPE IBR. Built for 450°F., steam service to 150 psi, and up to 500 RPM. Hydraulic service to 200 psi, 750 RPM. Higher pressure and speeds under certain conditions.

Single Flow Style—TYPE IBRSA. Similar to Type IBR. Sizes 1" and larger have 2-piece flange connected body.



For information about Barco Revolving Joints, ask for Bulletin 300.

BARCO

THE ONLY TRULY COMPLETE LINE OF FLEXIBLE BALL, SWIVEL, SWING AND REVOLVING JOINTS

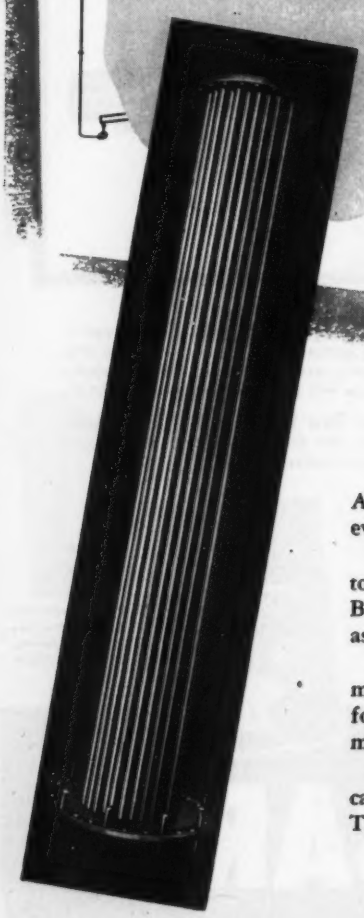
WORLDWIDE SALES AND SERVICE

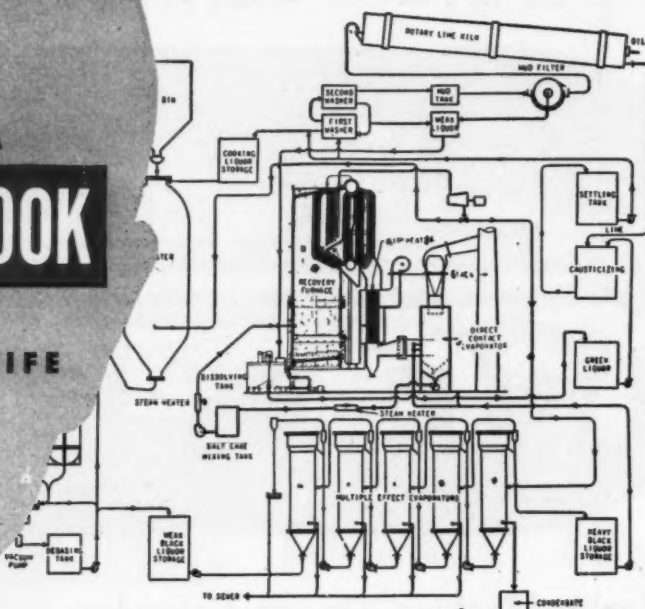
FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

LET'S TAKE A

CLOSER LOOK

AT TUBE LIFE





Are you getting the optimum cost-life ratio from tubing in condensers, evaporators, heat exchangers, recovery units, and other installations?

If you are undecided as to whether you are getting too much or too little from present tubing applications, consult Mr. Tubes—your B&W Tube Representative. Chances are he can give you valuable assistance in the light of today's critical materials situation.

For example, in a given service, re-tubing with certain lower grades may give savings in initial cost without materially affecting performance; or, under different conditions, switching to a higher alloy may pay service dividends far beyond a negligible increase in cost.

Send for Bulletin TB-328 containing properties, applications, fabricating data, and other information on B&W Seamless and Welded Tubes for Pulp and Paper Mills.

THE BABCOCK & WILCOX COMPANY

TUBULAR PRODUCTS DIVISION

General Offices & Plants

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill.
Cleveland 14, Ohio • Denver 1, Colo. • Detroit 26, Mich. • Houston 2, Texas
Los Angeles 17, Cal. • New York 16, N. Y. • Philadelphia 2, Pa.
St. Louis 1, Mo. • San Francisco 3, Cal. • Syracuse 2, N. Y.
Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-1676S

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 34 • NUMBER 2 • MAY, 1952

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MEASURED BY ACTUAL PURCHASE AND USE . . .

Favorite steam fit in the southeastern states, too!

The southeast states account for a good part of the paper industry's output. And they can give you a good account of Johnson Joints. Based upon actual purchase and use, Johnson Joints are the rousing favorite among steam fits in this area.

Nothing else combines *all* the advantages of the Johnson Joint; it is completely packless, self-lubricating, self-adjusting and self-aligning.

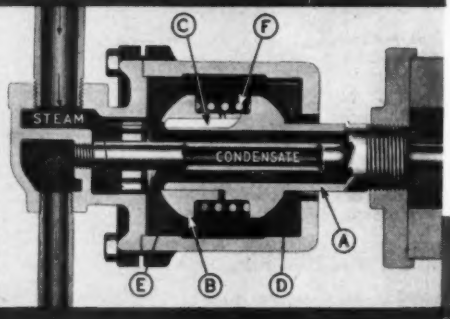
Certainly, nothing else can offer such a time-proved record of service—not just in the southeast but throughout the entire industry. It's a point worth considering: More mills, and more machinery manufacturers, have adopted Johnson Joints than anything of its kind.

Sizes and styles for all operating needs; including self-supporting Type S, and Type N for rotating syphon pipe; write for complete information.

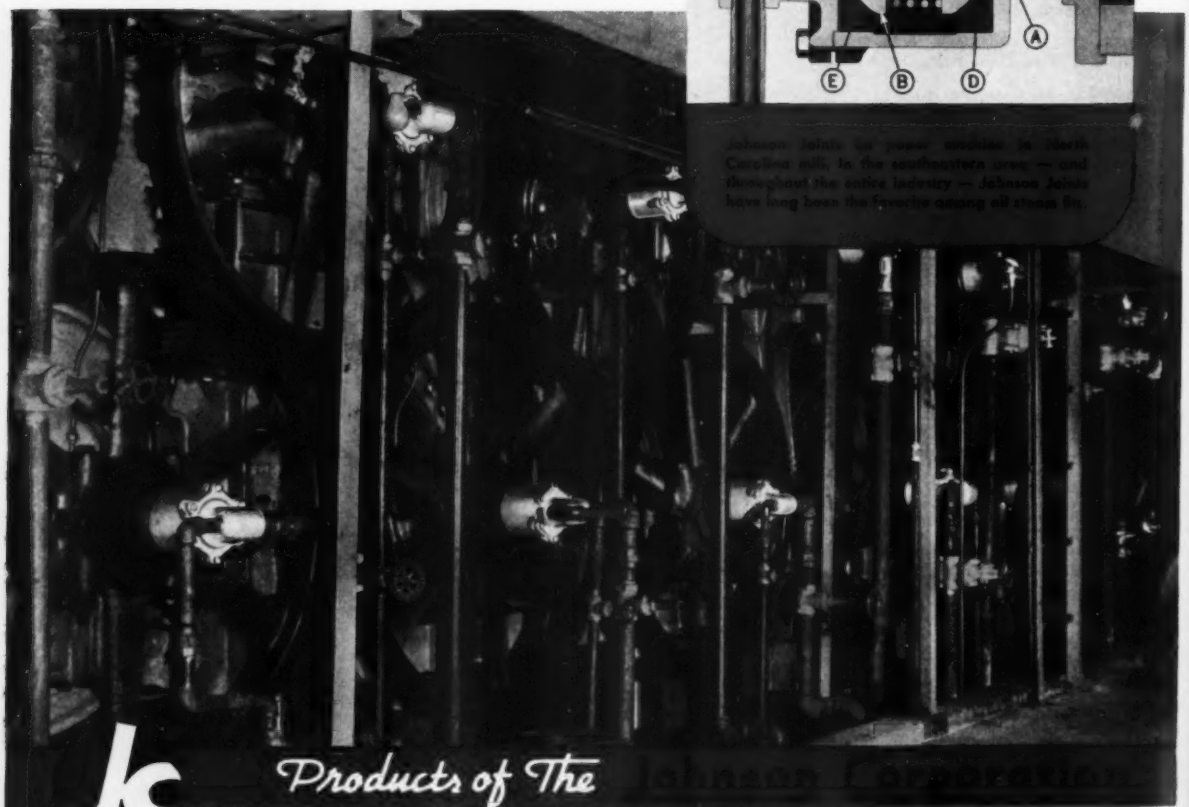
JOHNSON Rotary Pressure JOINTS

Quickly saves its own cost . . .

Nipple (A) is connected to roll or drum. Collar (B) is keyed to nipple at (C) but fits loosely so pressure can fill entire housing and serve as sealing force. Seal ring (D) and bearing ring (E) are of special carbon-graphite, eliminate all packing or need for lubrication. Spring (F) is for initial seating only; joint is pressure-sealed, consequently self-adjusting. Note space for lateral movement of rotating assembly, spherical seating for angular movement.



Johnson Joints on paper machines in North Carolina mills, in the southeastern area — and throughout the entire industry — Johnson Joints have long been the favorite among all steam fits.



Products of The Johnson Corporation

845 Wood St., Three Rivers, Michigan

Rotary Pressure Joints • Compressed Air Separators and Aftercoolers
Direct Operated Solenoid Valves • "Instant" Steam Water Heaters

IMPORTANT NOTICE

We are now the exclusive owner of licensing rights under U. S. Patent No. 2,591,106, granted to D. Manson Sutherland on April 1, 1952.

The title of the patent is "Paper Pulps and Papers and Process of Making Same".

This patent covers High Yield Kraft Process and "Hot Stock" Refining.

Licenses have been granted and are available on reasonable terms.

Foreign applications have been filed.

SUTHERLAND REFINER CORPORATION
TRENTON, NEW JERSEY
U. S. A.

SUTHERLAND

Designed, Engineered, Serviced **continuous beating systems**

by **SUTHERLAND REFINER CORPORATION**

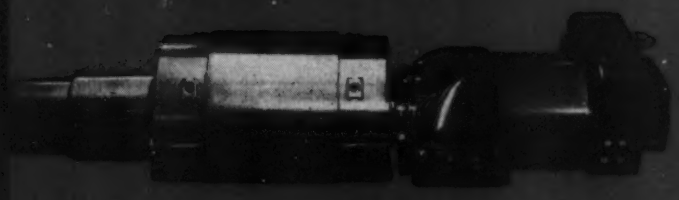
TRENTON 8, N. J.

ELLIOTT
equipment for power and process

Deaerating Heaters

Condensers

Generators for Diesels



Turbine Generators

Large Motors

Centrifugal Blowers

Tops in

HERE'S WHY

this Elliott turbine is the natural choice among men who demand sound performance with low maintenance:

AIRWALL LABYRINTH SEALS WITH NO RUBBING CONTACT protect bearings against dust, fly ash, etc.—

CENTERLINE SUPPORT assures constant alignment at all times, irrespective of possible expansion due to temperature changes—

PACKING GLANDS REMOVABLE without raising upper half of turbine casing—

SHAFT IS SPRAY-COATED WITH STAINLESS STEEL under the packing gland, eliminating special maintenance after shutdown—

TURBINE BUCKETS AND SHROUD OF STAINLESS STEEL for maximum life and sustained efficiency—

ROTORS DYNAMICALLY BALANCED for smooth operation—

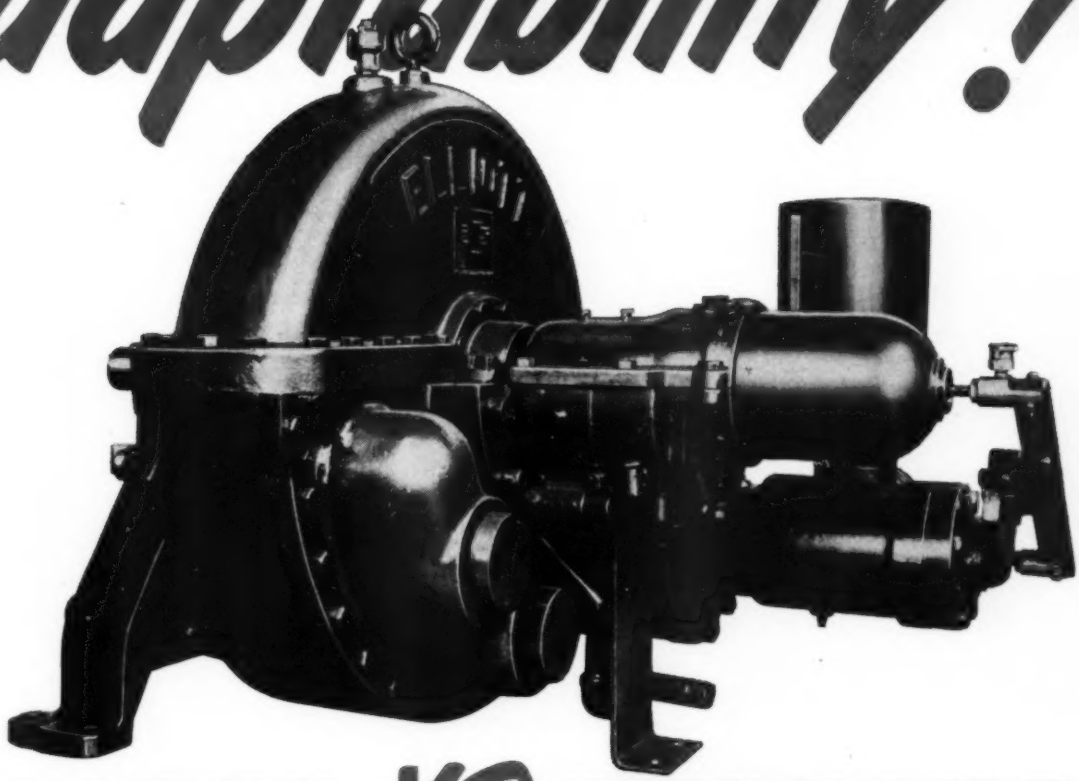
CONSTANT-SPEED GOVERNOR READILY ADJUSTED for permanent speed change—

BUILT-IN STEAM STRAINER of heavy stainless steel and

STANDARDIZED PARTS that fit all YR Turbines, greatly reducing parts inventory.

Bulletin H-16 has the full story. Phone or write your nearest Elliott office.

...adaptability!



ELLIOTT YR TURBINE

HERE'S WHY ***this popular turbine can be adapted to practically any operating conditions:***

- **Six elective control devices, including:**
  1. *Two handvalves controlling nozzling*
  2. *Hand-operated speed changer*
  3. *Remote control speed changer, air or electric*
  4. *High exhaust-pressure trip*
  5. *Remote control electrical trip*
  6. *Hand throttled emergency trip valve.*
- **Five frame sizes**
- **Eight different turbine types**
- **Your choice of several governors each independent of the standard overspeed governor**
- **Gland seal piping for condensing operation, or operation with gas**
- **Exhaust connection on either side**

ELLIOTT Company Q2-5

Steam Turbine Dept. • **JEANNETTE, PA.**

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HORTON DIGESTERS

...*World-Wide* Acceptance

As the pulp and paper industry is *world-wide* . . . so is the acceptance of Horton* digesters . . . and other structures built by Chicago Bridge & Iron Company such as blow tanks, liquor tanks, seal tanks, water tanks, accumulators, and Marx Savealls.

The digester shown in the accompanying views is one of two 9-ft. $10\frac{1}{8}$-in. diam. by 36-ft. 7-in. units which were shipped overseas for use in a foreign pulp mill. Though these digesters are the same size, one was built entirely of carbon steel, while the other was made of 20 per cent stainless clad material.

Our strategically located plants are equipped to build structures from a variety of metals to fit your specifications. We have facilities for stress-relieving and x-raying to code requirements and recently we have enlarged our facilities for treating steel with the Horton Pickling Process.

For complete information about how we can help you—write our nearest office. There is no obligation on your part.

**Trade Mark Registered U.S. Patent Office*

Above: This 9-ft. $10\frac{1}{8}$-in. by 36-ft. 7-in. Horton digester is shown at our Birmingham, Alabama, plant preparatory to being shipped overseas. It is built of 20 per cent stainless clad material.

● *Above: View showing bottom of stainless clad Horton digester being assembled.*

CHICAGO BRIDGE & IRON COMPANY

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Philadelphia, 3.....1653—1700 Walnut Street Building
San Francisco, 4.....1547—200 Bush Street
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Tulsa, 3.....1651 Hunt Building
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Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, LIMITED, FORT ERIE, ONT.

your pulleys will drive your machines only as well as your belts drive your pulleys

28-inch 3-ply Heart Oak leather belt with fixed idler, in woolen mill.

if you want more production get GRATON AND KNIGHT leather belting for more production power

Get a Graton & Knight "Live Traction" Leather Belt — because it is engineered to transmit maximum uniform horsepower at correct speeds and sustained R.P.M. — with ample reserve for load peaks, and "fluid drive action" to absorb starting torque and load shocks.

For tough conditions, cross, shifter and idler drives, **HEART OAK** top grade center stock oak tannage. For short center, small pulley, cone pulley and serpentine *precision* drives, **RESEARCH®** premium quality. For ambient conditions (steam, oil, water, acid and alkali fumes) **SPARTAN®** combination tannage . . . Whatever your conditions, you'll get more production-power with Graton & Knight *Engineered* Leather Belting.

and keep your belts pulling for you

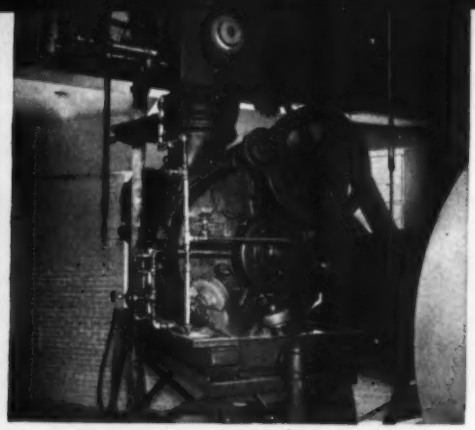
Stop belt slippage — prolong belt life with GRAKO® CLEAR Belt Dressing, result of 100 years experience in leather tanning and belt manufacture. Preserves and lubricates the fibres. Pint, quart and gallon cans — 5-gallon and 50-gallon drums. Send for circular.

New Belting Catalog and Manual shows how to get more production-power with leather belting. Our representative will deliver your (free) copy upon request. GRATON & KNIGHT COMPANY, Worcester 4, Massachusetts.

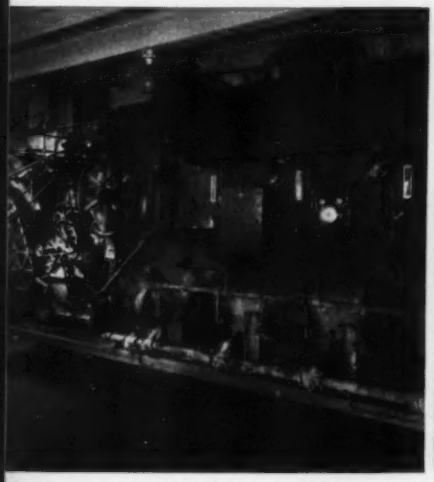
second centur G and K engineered leather belting for more production-power

GRATON AND KNIGHT Estab. 1851

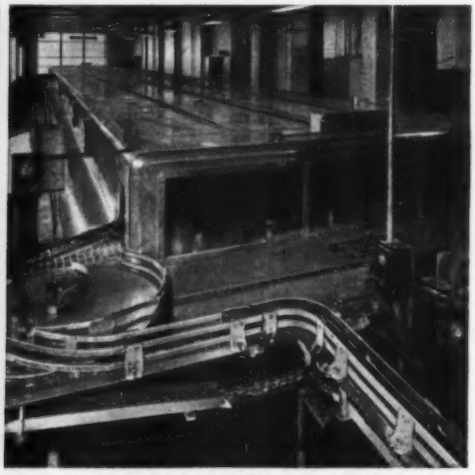
Keg scrubber—A constant stream of water at 130°F. plays over these barrels and reaches bearings on conveyor.



Wet-grain press—After being heated to 180°F., grain is then pressed dry. Hot water comes in contact with bearings.



Bottle soaker and washer—Bottles are first cleaned with strong alkali at 180°F., then washed with water. These conditions make bearing lubrication difficult.



Pasteurizer—Beer is pasteurized in this modern machine which is subjected to constant water spray ranging from 80°F. to 140°F.

No trouble brewing for bearings!

A midwest brewing plant employed seven different greases in a variety of applications. Despite the use of these special products, the operators experienced difficulty. The greases would not withstand both water and high temperatures. Frequent applications were necessary.

A Standard Oil lubrication specialist was called in on this problem. Upon his recommendation, STANOLITH Grease—a lithium-soap product with the ability to withstand both heat and water—was given the job.

As a result, STANOLITH has replaced all seven greases formerly used and *has done a better job in each type of application.* Through its use over a two-year period, grease consumption has been reduced 20% and time spent in applying grease cut 50%.

STANOLITH Grease can prove its remarkable versatility in your plant, too. Its high mechanical and chemical stability plus its extreme resistance to heat and water qualifies it to replace a variety of special greases.

STANOLITH
TRADE MARK
Greases

To obtain maximum benefits from STANOLITH, use the services of a Standard Oil lubrication specialist. His headquarters are near your plant. How you can benefit by his on-the-spot service is explained at the right. Standard Oil Company, 910 South Michigan, Chicago 80, Illinois.

What's YOUR problem?

Mr. D. V. Wills of Standard Oil's South Bend office is the lubrication specialist who helped this Midwest brewing company solve a difficult lubrication problem.

He is one of many Standard Oil specialists located throughout the Midwest. These men have the practical experience and special training to handle lubrication problems on any type of operation.

Take advantage of the service offered by the lubrication specialist nearest your plant. You can reach him by phoning your local Standard Oil Company (Indiana) office. Why not call, today, and arrange to discuss with him the advantages offered you by STANOLITH and other outstanding products such as:

STANOIL Industrial Oils—This general-purpose line of oils provides cleaner operation of hydraulic units and supplies effective lubrication in compressors, gear cases, and circulating systems. One or two grades can replace a wide variety of specials oils and lubricants.

SUPERLA Greases—Available in a wide range of consistency grades and in both lime-soap and soda-soap types, SUPERLA Greases cover a wide range of applications. These efficient products are comparable in quality with the highest type of special greases.

STANORUST Rust Preventives—The eight grades of STANORUSTS form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically developed for its intended use. The grades range from a fingerprint remover to a heavy petrolatum that protects against corrosion for years under the most severe outdoor exposure.

STANDARD OIL COMPANY **STANDARD** *(Indiana)*

NOW YOU CAN CONVERT BARK INTO PROFIT WITH THE VERSATILE FULTON ROLL PRESS

Actual photographs of FULTON ROLL PRESS in operation clearly show: (A) large volume of water being expressed from wet bark; (B) discharge of bark after dewatering and reduction.

de-waters and reduces mill refuse to more efficient fuel or by-product ... in one continuous, low-cost operation

With the FULTON ROLL PRESS, that pile of soggy bark, knots and screenings is quickly changed from a liability to an *asset*. This remarkable machine, perfected by the world's leading builder of sugar cane milling equipment after 99 years of experience, will:

- **DE-WATER** your bark, mill refuse and all kinds of fibrous material far more efficiently than conventional methods ... convert them into more easily-processed by-products or money-saving fuel.
- **REDUCE** your knots and screenings for redigestion or refining ... eliminating much of today's waste.

MAIL COUPON TODAY for full details and free test run of your material

Fulton Iron Works Company, Dept. 552
1259 Delaware Ave., St. Louis 14, Mo.
Please send full details of FULTON ROLL PRESS
☐ We are interested in FREE test run of.....
NAME.....
FIRM.....
ADDRESS.....
CITY.....ZONE.....STATE.....

FULTON

FULTON IRON WORKS COMPANY
SAINT LOUIS 14, MISSOURI
New York Office: 82 Wall St., New York 5

Mark of Excellence...

FOR **100** YEARS

Many, many years ago Adolphus Busch, co-founder of Anheuser-Busch, defined the reason for his company's growing success and reputation . . . "Making Friends is Our Business." Today, celebrating our 100th Anniversary, Anheuser-Busch still keeps faith with that same principle in all the phases of our business: Top quality for all Anheuser-Busch products . . . wholehearted, sincere service to our customers . . . and a continuous program of research and development to seek even better things for all the industries the company serves.

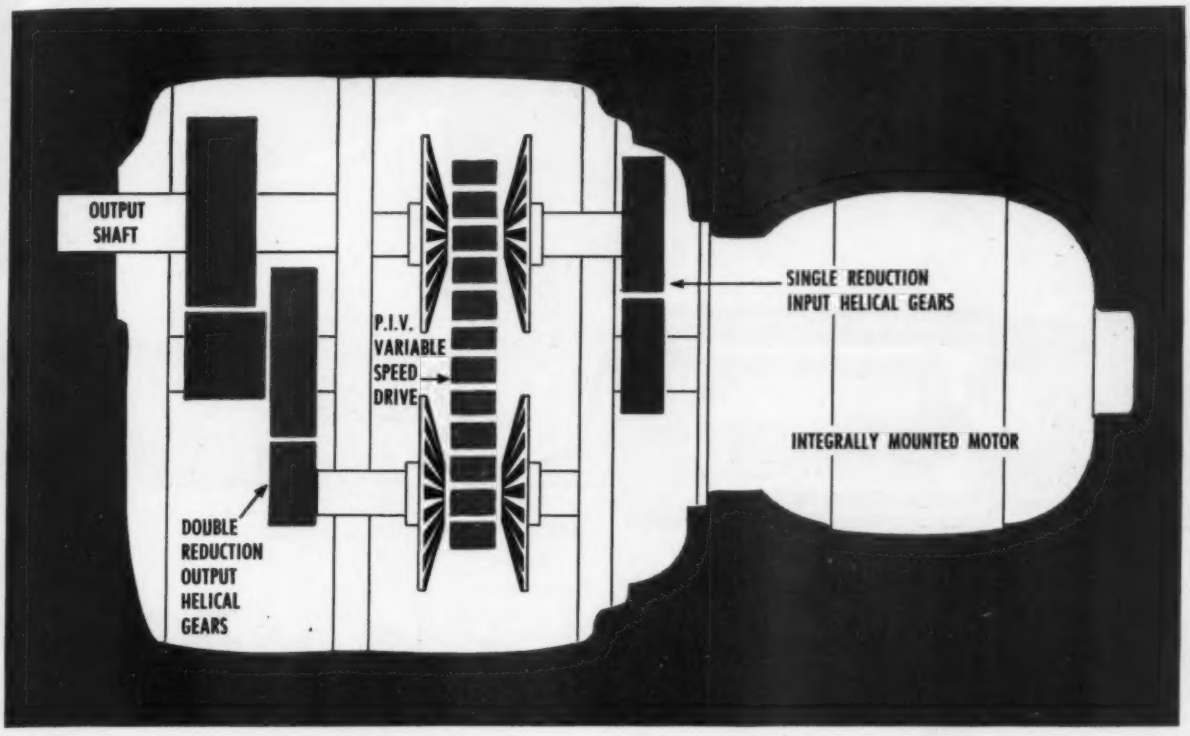
Corn Products Department

ANHEUSER-BUSCH, INC. . . ST. LOUIS

CORN STARCHES, DEXTRINES, GUMS & CORN SYRUPS

FOR THE PAPER INDUSTRY

Here's a complete package...



-- motorized variable speed drive PLUS speed reducer

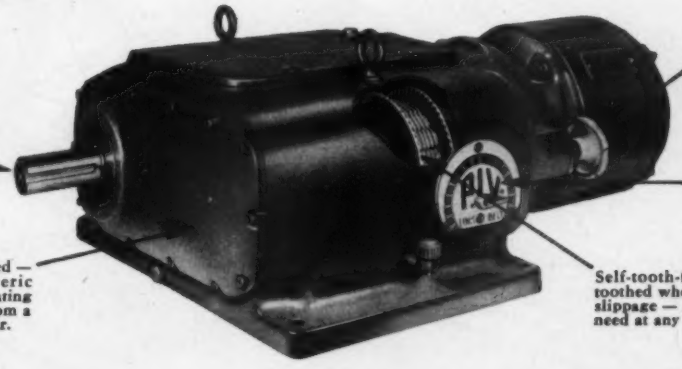
Whether your variable speed problem is simple or complex, Link-Belt's P.I.V. can increase the flexibility and efficiency of your machines. For this variable speed drive is not dependent on friction—you get exact speed selection in *positive,* infinitely variable settings.

Shown here is the Model HMDG. Both input and output helical gears and the variable speed drive are lubricated from a common reservoir. This is just one of dozens of P.I.V. drives Link-Belt power transmission engineers can choose from to match your exact requirements. Available in 8 types—vertical or horizontal—with or without extra reduction gears—with or without motors.

P.I.V. LINK-BELT
VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa), Sydney (Australia). Offices in Principal Cities. 12.841

ALL INDUSTRY USES P.I.V.*
*Positive, infinitely variable



You can get instant speed changes and maintain them accurately while operating under full load.

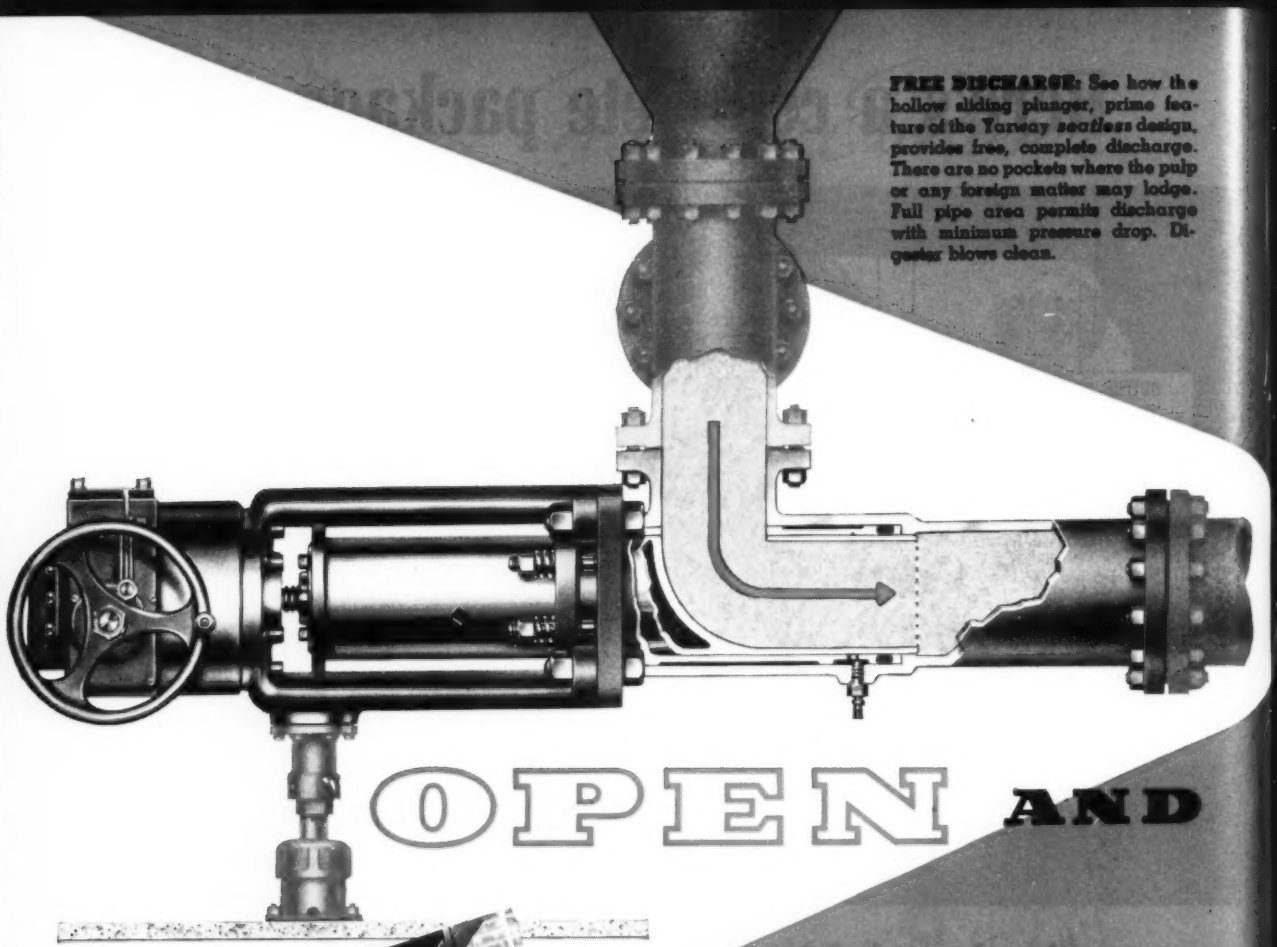
An infinite number of positive, stepless speed adjustments may be made with manual, electric, pneumatic or hydraulic controls.

Easy-view speed indicator facilitates speed selection and adjustments to meet all requirements.

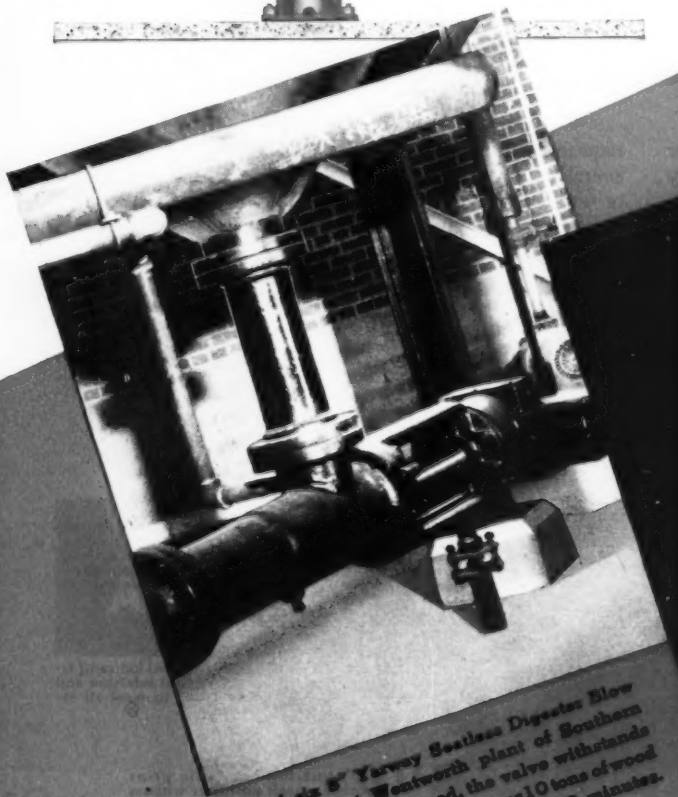
All-metal, totally enclosed — unaffected by atmospheric conditions. All vital operating parts splash-lubricated from a common housing reservoir.

Self-tooth-forming chain grips toothed wheels positively without slippage — gives the speed you need at any setting.

FREE DISCHARGE: See how the hollow sliding plunger, prime feature of the Yarway *seatless* design, provides free, complete discharge. There are no pockets where the pulp or any foreign matter may lodge. Full pipe area permits discharge with minimum pressure drop. Digester blows clean.

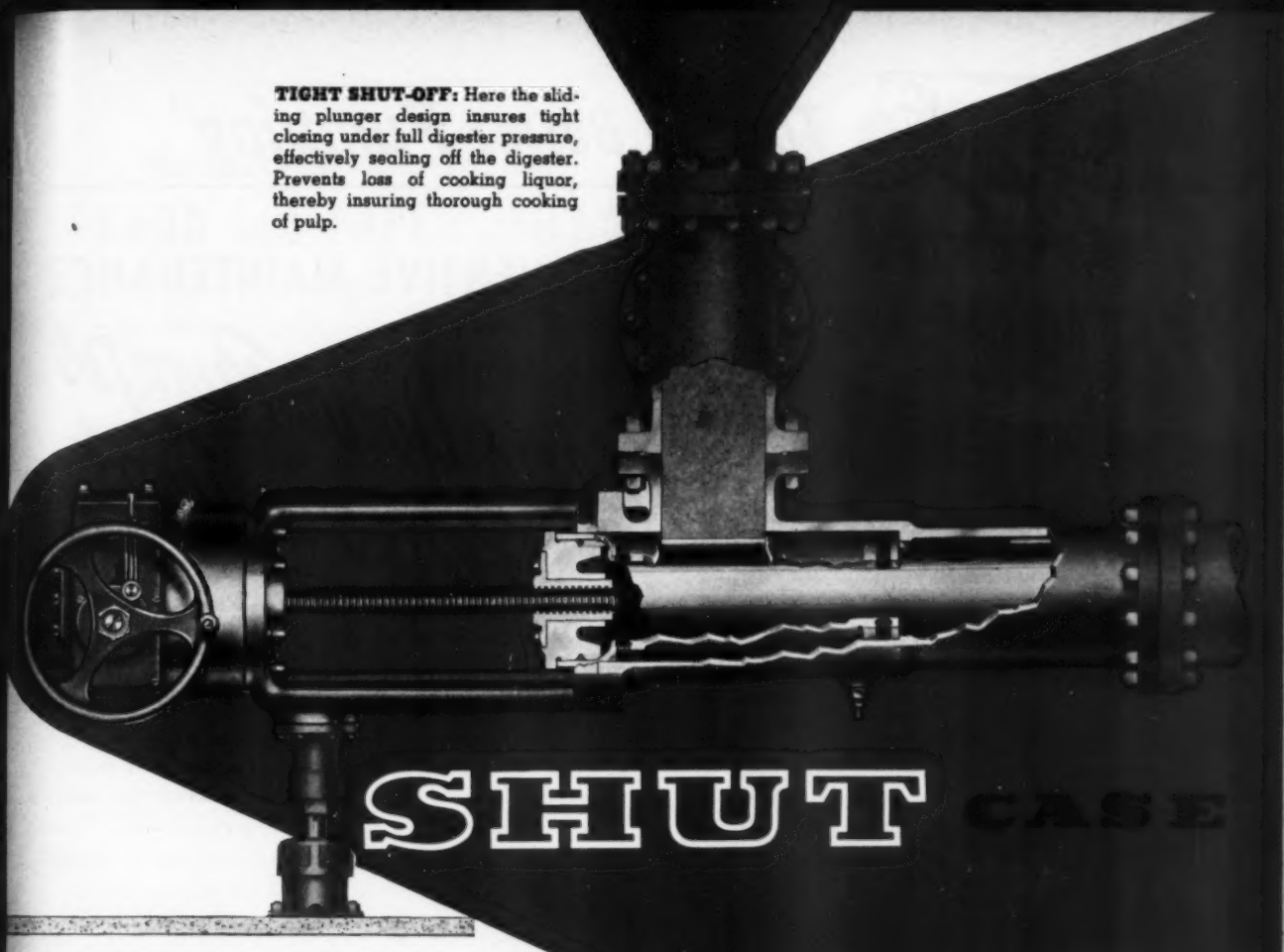


OPEN AND



One of six 8" Yarway Seatless Digester Blow Valves at Port Wentworth plant of Southern Paperboard Corp. Closed, the valve withstands 150 psi. pressure; open, it passes 10 tons of wood pulp and used cooking liquor in 12 minutes.

Battery of 5 Yarway Seatless Digester Blow Valves installed on digesters at plant of Coosa River Newsprint Co., Coosa Pines, Alabama



TIGHT SHUT-OFF: Here the sliding plunger design insures tight closing under full digester pressure, effectively sealing off the digester. Prevents loss of cooking liquor, thereby insuring thorough cooking of pulp.

FOR YARWAY DIGESTER BLOW VALVES

These two cross-section views of the Yarway Seatless Digester Blow Valve, in open and closed positions show two good reasons (free discharge and tight shut-off) why Yarway Valves are being used on more and more pulp digesters.

Besides the advantages inherent in the seatless design, Yarway Blow Valves have certain other important features:

FAST OPERATION—by remote push button control, these motor-operated valves speed digester discharge . . . in one typical mill, resulted in an increase of 20 tons of pulp a day.

RUGGED CONSTRUCTION—built to withstand the shock and wear of toughest service. Frequently take up to 6000 blows before reconditioning.

MODERN METALLURGY—such as lower gland (sleeve) of chromium nickel stainless steel and sliding plunger of hardened stainless steel—resists wear and chemical action.

If you are interested in *safety in operation, increased production, low maintenance, savings in labor*—then write for Yarway Bulletin B-440.

YARNALL-WARING COMPANY · 149 MERMAID AVENUE, PHILADELPHIA 18, PA.

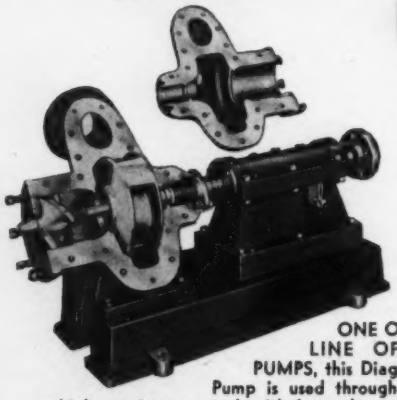
Branch Offices in Principal Cities

"Buffalo"

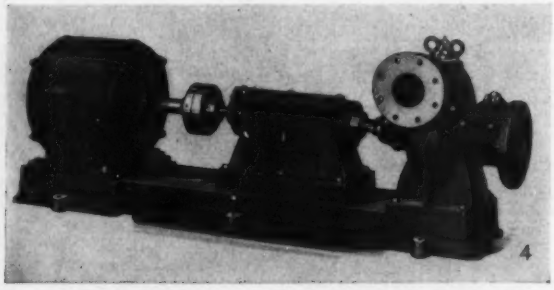
Tips on Better Pumping

REGULAR PREVENTIVE MAINTENANCE

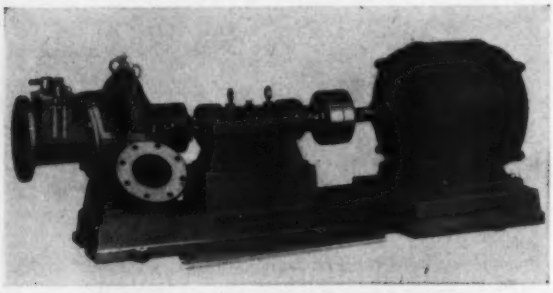
Keeps Your Pumps Performing!



ONE OF A COMPLETE LINE OF "BUFFALO" PUMPS, this Diagonally Split-Shell Pump is used throughout the industry on high consistency stock with low submergence. Easily removed upper half of casing makes periodic inspections a simple matter. Enclosed impeller retains initial high efficiency.



SIMPLE TO SERVICE—this "Buffalo" Full Ball Bearing Single Suction Pump for size, lime, clay solution, silicate of soda and many corrosive liquids has only one bearing to lubricate.



HORIZONTAL SPLIT-SHELL design provides for easy servicing of the "Buffalo" Single Suction Pump for high head jobs. For further useful information on the pump to handle your liquids, write for BULLETIN 953-G today.

● Even the best constructed pumps require regular servicing for efficient performance and long life.

The best way to insure the success of a preventive maintenance program is to set up a regular schedule for servicing and inspection. A qualified engineer who knows pumps and lubricants should be the one to set up this schedule.

The schedule would call for at least four inspections of each pump annually, to check on bearings, shaft alignment, packing, impeller and lubrication. The inspector makes a report of any conditions which need correcting —conditions requiring servicing, to the operating group; conditions requiring repairs, to the maintenance group. (Often, these reports prevent minor conditions from developing into major troubles.)

The schedule for lubrication, as well as any operating instructions, should be posted plainly on or near each pump.

This is another in a series of messages by Buffalo Pumps, Inc. in the interest of conserving materials and industrial equipment.

"Buffalo"

BUFFALO PUMPS INC.

213 MORTIMER STREET — BUFFALO, NEW YORK

Canada Pumps Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

Now Available to ALL

BOARD and PAPER MILLS

A modern, practical and PROVED way of:

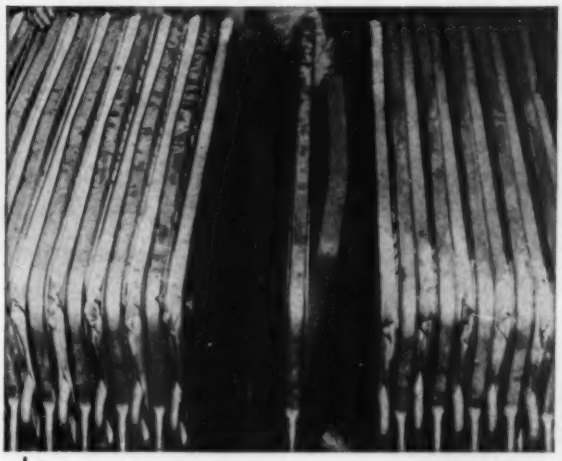
1. Fully controlling the water balance in a mill.
2. Decreasing to the point of a "closed system" status the use of fresh water.
3. Simplifying and controlling any slime and odor problem due to micro-organism action.
4. Increasing production and felt life.
5. Decreasing furnish cost and the use of artificial brightness additives where white grades are made.
6. Saving heat and power.
7. Completely recovering effluent solids and in usable form.
8. Eliminating stream pollution.
9. Providing a high investment opportunity.

OCO Water Systems

(Patents Applied For)

A typical 3-unit installation, compact-automatic feed and pressure control.

Pressure filters "at work" removing solids and slime and odor-forming bacteria.



All solids from the white water are re-usable in cake form at about 35% consistency.

Your inquiries are invited. Our nearest representative will be pleased to work with you and to give you complete information.

Fort Miller, N. Y. **OCO Water Systems, Inc.** Rittman, Ohio

Sales Representation: **The Sandy Hill Iron & Brass Works, Inc., Hudson Falls, N. Y.**
E. C. Jacobi, Green Bay, Wis. **A. H. Lundberg, Seattle, Wash.**
C. L. Koerner, Portland, Ore. **Whitco Enterprises, Toronto, Ont.**

Principal Equipment Manufacturers: **Valley Foundry & Machine Works, Inc., Fresno, Calif.**
The Sandy Hill Iron & Brass Works, Inc., Hudson Falls, N. Y.

PARTICIPANTS IN THE PROGRESS OF PAPER-MAKING

Chemicals . . . produced by an industry which has made magnificent contributions to paper-making progress through applied research.

Fourdrinier Wires . . . fabricated for 56 years by Appleton Wire Works, Inc., where continuous research – directed toward making a better product–has *earned* the acknowledgment that *"Appleton Wires are Good Wires!"*

APPLETON WIRE WORKS, INCORPORATED • APPLETON, WISCONSIN

WHERE RELIABILITY COUNTS AND DEPENDABILITY IS A MUST

The ingenious, simply-designed mechanism of Fisher Wizard Controllers provides extreme accuracy and dependability in pressure control.

Fisher Wizard Controllers will completely solve your pressure control problems. They are individually built to meet your exact operating conditions, and are guaranteed to give satisfactory performance.

High pressure Fisher Wizards are available in throttling and snap acting types. Bourdon Tube pressures from 5 to 10,000 P.S.I. Diaphragm or remote panel mounting.

Low pressure Fisher Wizards available in diaphragm type mounting only. Bellows pressures from ½ to 15 P.S.I.

FISHER LEADS THE INDUSTRY IN RESEARCH FOR BETTER PRESSURE CONTROL

FISHER GOVERNOR COMPANY Marshalltown, Iowa

Why Your Camachines

stay on the job!

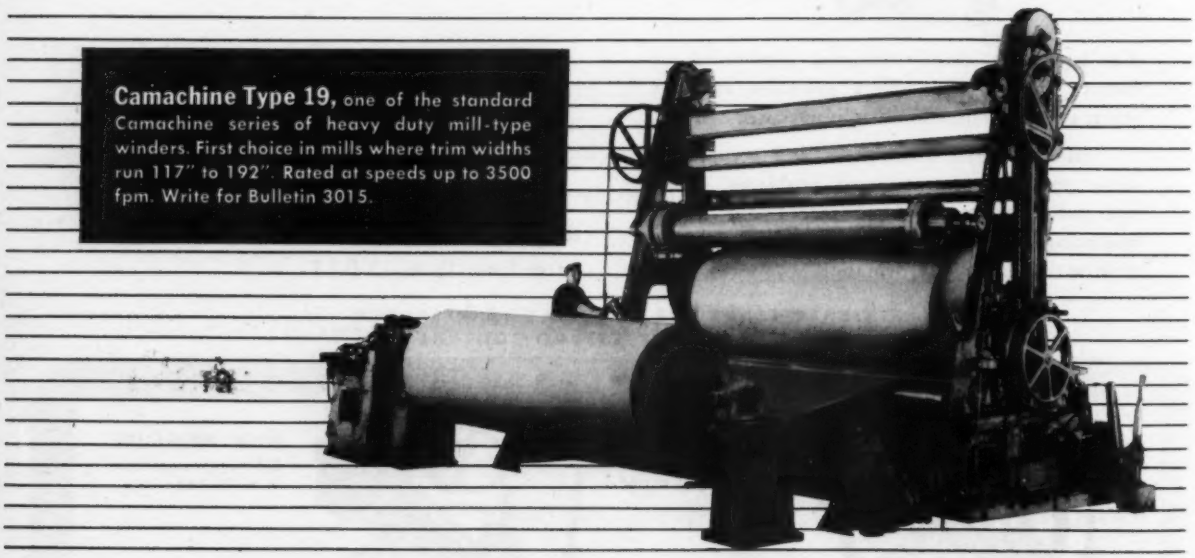
Traditional Camachine dependability is backed by the greatest concentration of experience and ability that you'll find anywhere in the field of slitting, roll winding and constant tension equipment. Your Camachine is designed and built by *specialists* to meet the particular requirements of your plant.

Your Camachine provides for fast change-overs from job to job. You can set up for a new run in a few minutes time, with quick, easy adjustments in strip width settings, threading, speed, tension, roll density and slitter wheel pressure. Optional equipment, operating in smooth, semi-automatic sequence (including rewind shaft injector, hydraulic riding roll lift, roll ejector and hydraulic roll lowering table) makes roll changes easy.

Your basic Camachine design, developed through years of specialization and practical field experience, anticipates normal maintenance requirements by providing for easy accessibility, and interchangeability of parts. Also, with Camachines so predominantly the choice in paper, board and pulp mills everywhere, it follows naturally that Cameron has developed unmatched facilities for handling your normal replacement parts orders.

Your Camachine is built to do a better quality job, to change swiftly from job to job, and to *stay* on the job. For detailed information please request your free copies of Camachine mill-type winder bulletins.

CAMERON MACHINE CO. • 61 Poplar St., Brooklyn 2, N.Y.

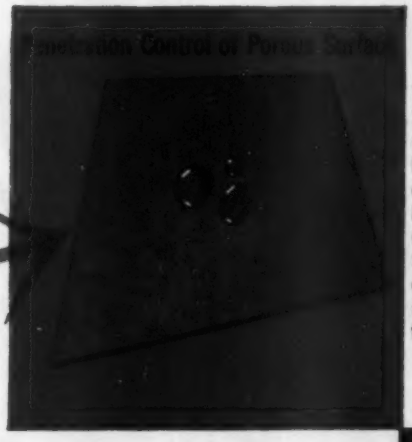


Camachine Type 19, one of the standard Camachine series of heavy duty mill-type winders. First choice in mills where trim widths run 117" to 192". Rated at speeds up to 3500 fpm. Write for Bulletin 3015.

CONSIDER DEPENDABILITY AND YOU'LL WIND UP WITH *Camachines*®

AA-256

the blotter that WON'T BLOT!



This unretouched photograph shows a 1% solution of KELSIZE twenty minutes after being puddled on blotter. Note how solution remains on surface of blotter. This test illustrates that KELSIZE is an excellent material for controlling penetration and strike through of aqueous solutions, thus increasing the efficiency of adhesive or surface sizing solutions by retaining them at the area of application.

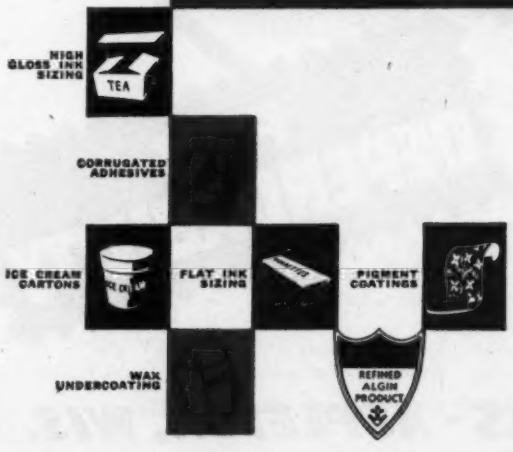
proof THAT YOU REGULATE SURFACE DENSITY AND PENETRATION... *precisely and effectively!*

Here is unretouched photograph of water, without KELSIZE, on piece of same blotter, taken seconds after water was placed on blotter. Note how water has immediately passed into blotter compared to controlled penetration of KELSIZE solution.

kelsize and kelgin

superior surface control agents

Due to their film forming properties, KELSIZE and KELGIN effectively control penetration of adhesives, starch solutions, or any water base solution.



KELSIZE and KELGIN®

products of KELCO *company*

20 N. WACKER DRIVE CHICAGO

31 NASSAU STREET NEW YORK 5

530 W. SIXTH STREET LOS ANGELES 14

FOR SERVICE

Appleton

FELTS

FOR DESIGN AND FINISH

FOR UNIFORMITY

FOR DEPENDABILITY

APPLETON WOOLEN MILLS - *APPLETON, WIS.*

Loads Two for One with TD-9

MORE LOADS PER TRIP...MORE WOOD PER DAY. Ed Jenkins' International TD-9 brings another load out to a dry spot for the trucks to haul away.

How International power pays off for Arkansas lumberman

Down Crossett, Arkansas way, Ed Jenkins harnesses International power to haul his lumber to dry spots where trucks can pick it up—and to double his output.

Ed has an International TD-9 crawler on the job . . . and here's what he says about it:

"My TD-9 has the power and I can load two trucks now, where with the crawler I had before, I could load only one."

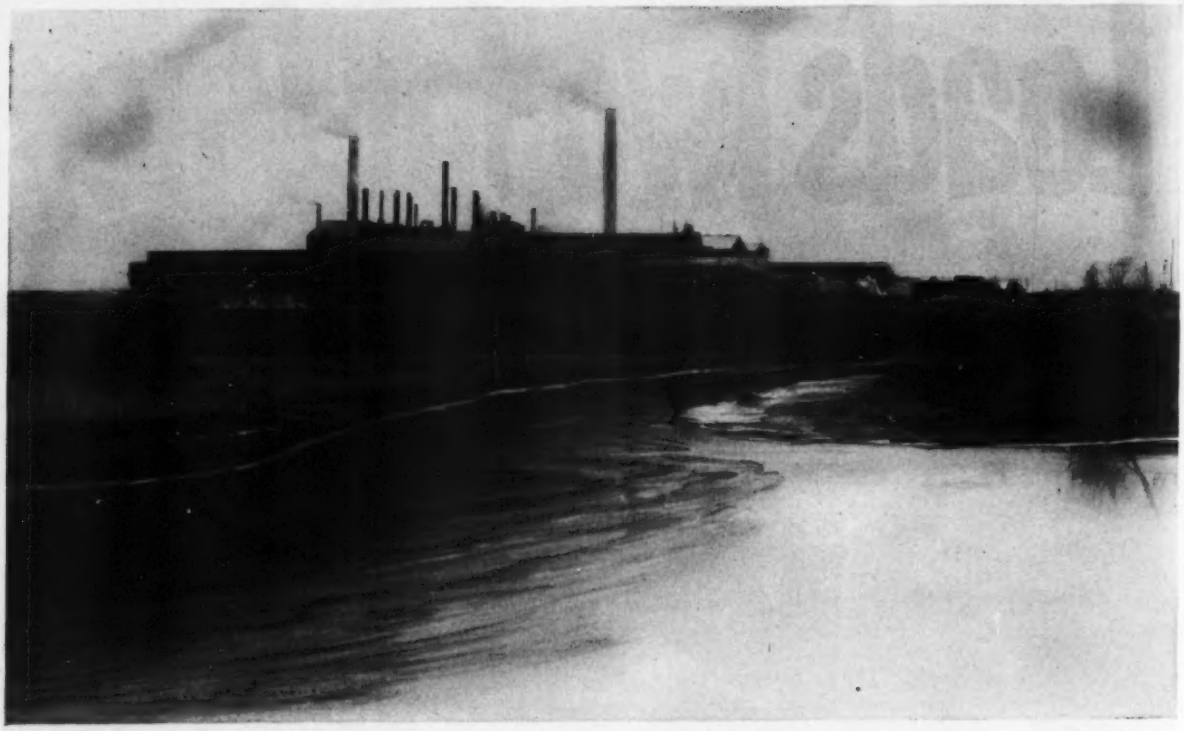
In these days of rising costs, look into the ways International power can help you increase your output. There are International tractors and power units to meet every logging job. See your International Industrial Distributor and get the details on International *"Power that Pays."*

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS



WORRIED ABOUT WASTE DISPOSAL?

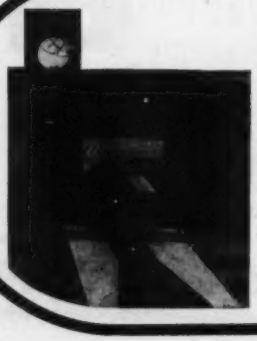
Bailey Meters Help you to Reduce Pollution

● The disposal of industrial wastes without stream pollution calls for careful planning and continuous vigilance.

That's where Bailey Meters and Controls come in. We measure the flow and pH of sewage, sludge, and industrial wastes flowing in open channels or pipe lines. These and other factors, such as levels, rates of chemical feed, and flow of air, may be co-ordinated into a completely automatic system for the treatment and disposal of waste materials.

When you want fast, complete and authoritative answers to the measurement and control aspects of your waste disposal problems, reach for your phone and call your local Bailey Engineer. Offices in all principal industrial centers.

P-24



BAILEY OPEN CHANNEL METERS

These indicating, recording and integrating meters are suitable for measuring industrial wastes, sewage, sludge, corrosive liquids, and irrigation water flowing in all types of open channel primary metering devices, such as Venturi flumes, weirs, or nozzle flumes. Electric or pneumatic telemetering permits location of receivers wherever desired. Ratio of flows and chemical feeds may be controlled automatically.

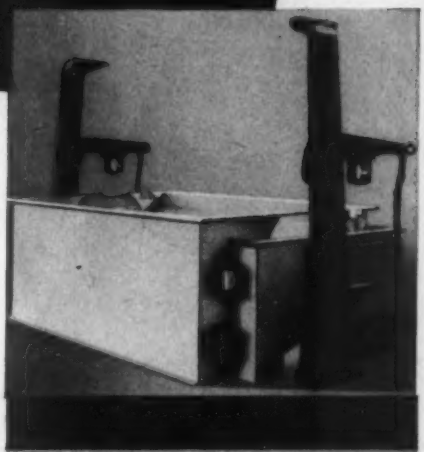
BAILEY METERS

BAILEY METER COMPANY

1058 IVANHOE ROAD
CLEVELAND 10, OHIO

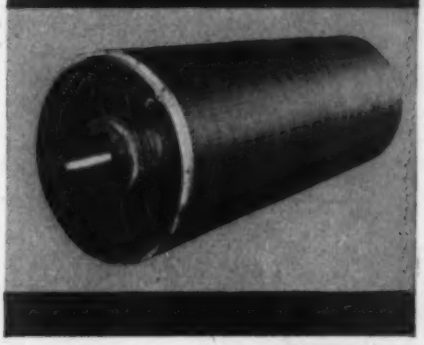
Process Controls
TEMPERATURE · FLOW
PRESSURE · LEVEL
GAS ANALYSIS · RATIO

CONSERVATION



Conservation of timber resources is an important and vital factor in our country's economy. This conservation can go farther. It can be applied in the paper and board making industry through modernization of existing machinery.

Modern efficient vats, the Downingtown Proflow and Conflow Vats, help conserve paper by insuring a better sheet formation. This results in fewer rejects and waste in the paper and board making process.



Downingtown manufactures the cylinder moulds and plain or suction type cylinder couch rolls required for board machine vats.

Find out how Downingtown Proflow and Conflow Vats can help your production. Write for specifications and performance data or consult your Downingtown Sales Engineer.

MODERNIZATION IS CONSERVATION

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Building, Portland 4, Oregon

Downingtown Fibrepulper, Manufactured in Canada by Waterous, Limited, Brantford, Ontario

DOWNINGTOWN PROFLOW AND CONFLOW VATS

DESIGNERS AND BUILDERS OF PAPER, BOARD AND FELT MACHINES SINCE 1880

FORMULA *for performance . . .*

. . . NOT SPECULATION

when you specify PERKINS Rolls. PERKINS Rolls have behind them the longest and broadest experience in the Roll-making industry.

B. F. PERKINS & SON, inc.

Engineers and Manufacturers

HOLYOKE • MASS.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

The better the valve, the less it will require maintenance
With Powell, it's not "how many" but "how good." Powell Valves are so good that they operate most efficiently, last much longer, and require far less maintenance. In short, Powell can give you flow control at its best.
There's a greater variety of Powell valves in use today than of any other individual make.
The Wm. Powell Company
Cincinnati 22, Ohio
Fig. 375—800-pound Bronze Gate Valve with renewable, wear-resisting "Powellium" nickel-bronze disc.
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1846

How to maintain a density of

Plus or Minus 1½%

through a caliper range of

5 to 150 Points

Hurletron Caliper and Weight Control equipment is maintaining this precise control in many leading mills . . . and it can do the same for you . . . automatically . . . dependably . . . day in day out.
Actually, this equipment does six important jobs:

- **Holds wet end fluctuations to plus or minus one point**
- **Measures thickness at 40" intervals clear across the sheet**
- **Makes corrections by regulating flow of stock *but only when a trend has been established***
- **Provides a continuous, permanent record of wet end caliper**
- **Signals operator when a drift across the sheet is indicated**
- **Provides a continuous reading and record at the dry end**

Result . . . consistently uniform quality of product . . . a tremendous saving in raw stock . . . a worthwhile reduction in waste . . a big saving in operator's time.

If you're interested in bigger and better production for less money, talk things over with one of our engineers. There's no obligation. Write today.

HURLETRON
Automatic
CALIPER and WEIGHT CONTROL

WRITE FOR THIS BULLETIN

Contains full details about the Hurletron equipment . . . shows what it is doing in leading mills . . . includes interesting charts and photos. Ask for Bulletin No. 211.

ELECTRIC EYE EQUIPMENT COMPANY

10 WEST FAIRCHILD STREET • DANVILLE, ILLINOIS

Human papermakers learned well from the wasp

As early as 1719, the celebrated naturalist, René Réamur reported the manner in which the wasp made paper from wood . . . where man used only rags and linen. Observing the world's first professional papermaker in action, Réamur learned that the wasp chews wood fibers, mixes them with a natural size and spreads this paste to dry into a paper substance for its nest.

Man may have been late in discovering what the wasp already knew . . . but modern paper products show how well he learned. Serving America's progressive paper industry for more than 30 years, Staley's sizing starches, adhesives, plasticizers and dextrin products improve quality in many of the nation's leading mills. Why don't *you* investigate the advantages of using Staley's reliable raw materials and expert technical assistance? For further details, contact your supplier—or write direct.

PIONEERS IN PRODUCTS FROM
Staley
CORN AND SOYBEANS

A. E. STALEY MFG. CO. Dept. PI-5, Decatur, Illinois

SIZING STARCHES
Staley makes a full range of starches and dextrins for beater, surface or calender sizing.

CORRUGATING AND LAMINATING
Choose Staley's finer corrugating starches, special laminating and kerg adhesives.

COATING ADHESIVES
Staley Starches and Dextrins give better ... results for machine or regular brush coating.

PLASTICIZERS
"Sweetose" and Staley's Corn Syrup are ideal softening agents for glassine paper.

WYANDOTTE
CHEMICALS
A call for Wyandotte Technical Service involves no obligation. It may be the means of adding a valuable sales advantage in better coating for one or more of your papers.

Art Radebaugh touches up a drawing depicting the future.

Can this whitest calcium carbonate, PURECAL M, help you sell more paper?

Art Radebaugh, an artist, tells requirements for good reproductions. Read how Wyandotte PURECAL M helps you meet them.

Art Radebaugh, famous artist whose drawings of the future are widely used in newspapers, magazines, books, and advertising matter, says, "Often, I've spent hours changing a job, not to improve the drawing, but to help it to reproduce better on a stock which was either off-white or would not take the ink well.

"You do not need high gloss to make a halftone of a good drawing stand out, but you do need a real white-white paper with a smooth, uniform surface and good inking qualities."

To paper makers

If you want to get the finest finish for your paper, whether for offset or letterpress, use Wyandotte PURECAL* M. It is a pigment of highest purity for paper coating. Because Purecal M is always uniform in quality and in particle size, free of grit and other abrasives, it insures a uniform, smooth coating of high whiteness and hiding power.

A sales suggestion

If your coated papers contain PURECAL M in the coating medium, pass this information along to your sales force. If you are not using it and would like to investigate its possibilities, write us for full application data. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in Principal Cities.* *Trademark

Wyandotte CHEMICALS

We're Building 'Em BIG and We're Building 'Em *Fast*

Things are really humming these days at the Moore & White plant. Complete Fourdrinier and Cylinder machines *have* been built, *are* being built, and *will* be built—as fast as such mechanical mammoths *can* be built.

In the plants of some of the nation's leading paper and board manufacturers, recently built Moore & White machines are now in operation turning out the material needed to meet the zooming demand of business and industry—and doing it with the efficiency that spells profit.

Work in progress in the Moore & White plant today—on the machine tools and on the drawing boards—includes complete paper-making machines for new customers and for customers who have long known that there's no place like Moore & White for getting things done, big or small.

Whatever your need for paper-making machinery, drop your problem in our lap—if you can catch us sitting down long enough for that.

The MOORE & WHITE Company 15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM-BUILT MACHINES FOR PAPER MAKERS

Merfenel 51*

*PACKED IN ONE AND TWO OUNCE ENVELOPES

A new Product

FOR
SLIME CONTROL
•
MOLD PROOFING
•
PRESERVATION OF
STARCHES AND PROTEINS

R. T. VANDERBILT CO. INC.

230 Park Avenue, New York 17, N. Y.

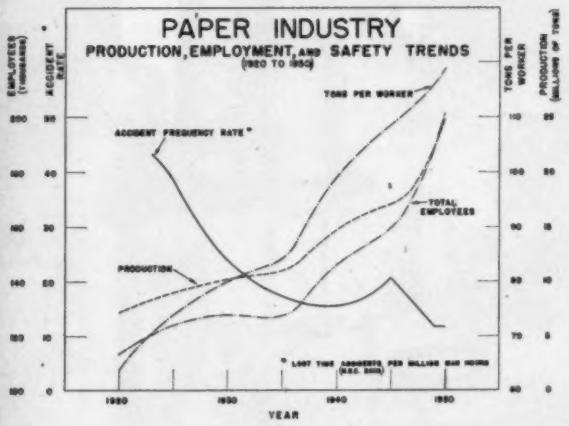
The Paper Industry

May 1952

Human maintenance

Since the close of World War II the pulp and paper industry has poured millions of dollars and still more millions of man-hours into expansion and modernization projects. Completely new mills have been put into operation, many are now under construction. The industry as a whole has shown rightful pride in its outstanding growth, has demonstrated its vital role in the American economy by last year turning out a record-breaking 26,000,000 tons.

This upward-trend in production has resulted from many and varied factors. New and improved equipment has of course been indispensable. Better operating



procedures in all departments, from the woods to the warehouse, have contributed greatly to the increased quality and quantity of recent years.

But more important than better equipment and improved operating methods has been the increased effort toward mill safety in the industry. For although horsepower does the work, manpower does the thinking. Teaching a man to think and work for both his own and his firm's benefit is the responsibility of every employer. Instruction in safety is without a doubt of utmost importance to that benefit. It cannot be denied that no matter the cost or design of a machine its worth can only be computed in terms of the efficiency of its operator.

The paper industry in both the United States and Canada has in the last 30 years invested valuable time and millions of dollars in the safety of its workers. This kind of an investment ranks above any other. A new paper machine loses its worth to management if the men who operate it are untrained. For safety in the mill increases production through its influence on good operation, lowers cost through its effect in reducing insurance charges, and raises morale through the healthy and whole bodies that result from its practice.

And the industry is becoming a safer workshop. According to the National Safety Council, in 1923 the accident frequency rate for the Pulp and Paper Section was 43.5 (lost-time accidents per 1,000,000 man-hours worked). The 1950 frequency rate was 11.8. The corresponding accident severity rates were 2.73 (1923) and 1.05 (1950).

Still not satisfied with its performance, the industry put forth even more effort in 1951, establishing a new all-time low accident frequency rate of 9.83. This achievement was gained by the 424 participants in the NSC annual safety contest. Involved in the record were 475,736,000 man-hours of labor in all types of mills and plants.

Thus, while the rate of growth in the industry has in the past several years been outstandingly rapid, the accident rate has been sharply decreased. Human maintenance has not been overlooked during a period when safety might easily be forced to take a back seat. The pace has been terrific. Plants built, employees hired, annual capacity, speed of machines, output per worker, hazards encountered, machines installed, worth of product—all these phases of the industry have increased markedly. Accident frequency and severity have decreased just as markedly.

This accomplishment has been by no means automatic. It has been attained by capable production people and safety experts cooperating as a team. Publications, safety aids, posters, films, film strips, and other safety ideas have gone into the combined effort of the 300 key companies and 800 plants associated with the National Safety Council. The bulk of these companies have full-time safety directors, who cooperate with the Executive Committee of the Pulp and Paper Section.

It has been said by *National Safety News,* published by the Council, that "pulp and paper safety administrators are near the top when it comes to energy, seriousmindedness, foresight, and constructive action against industrial accidents in their respective field." But, lest a well-deserved compliment be taken as meaning a job well-done, let it be remembered that the job is by no means "done." As the industry expands, the task of preserving life and limb is just that much more challenging. 1951's accident frequency rate of 9.83, while good, is by no means ideal. Perfection is the one and only condition not capable of improvement.

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The Paper Industry Current Comment

Business tension easing

Every indication from Washington is that the drop in business activity is such that controls are on the way out in many commodities. All control has been lifted from pulp, and decontrols are being formulated in commodities in other industries. The tensions of the defense period are easing in other respects. There are fewer calls for new defense activities, a move is in the making for easing curbs on installment buying, and there are fewer complaints of shortages in various fields.

The first quarter was definitely slower than any quarter of 1951, the second quarter is still sluggish, but there is every indication that depleted inventories may be so low that there will be renewed buying in the third quarter.

The political picture is beyond any forecast except by crystal ball guessing. The administration is willing to let wages rise, to encourage buying with the extra funds in the hands of workers, as an indication of prosperity—even a false prosperity—for its effect on the November elections.

That, in brief, is the panorama of which the paper industry is a specific part. There is little indication that 1952 production of paper will be greater than in 1951, despite earlier forecasts to the contrary, and conditions are now such that salesmen have to work harder to get orders than for many years past. Operations, except in the paperboard field, are at a normally profit-producing ratio, and even in the paperboard field there are signs of an end to the slump.

Sales up, profits down

Despite record volume of sales, net profits shown by paper mill reports are universally materially lower than last year due entirely to the larger bite taken by the government in the form of taxes. Not in a single case, however, has there been any action to reduce dividends paid to stockholders. The narrowing margin of profits, however, is likely to be a forerunner of a prolonged period of less-than-the-best prosperity. The future depends largely on the extent to which the steel wage dispute affects prices and wages in other industries. While the United States is laboring in a defense economy, Canada is prospering to an unprecedented extent. Today the Canadian dollar is worth $1.02 in United States money. A rigid policy of restricted spending across the border is leading American dollars into Canadian industries at a rapid rate.

The decontrol of pulp has been accompanied by other developments affecting the pulp market. Because of the drop in prices, Sweden has radically reduced its export tax on pulp. For instance, the export tax for the second quarter on bleached sulphite has been cut from 540 crowns per ton to 200 crowns. This step was brought about by Britain's pegging prices of imported pulp and threats of similar action by other European countries unless prices were reduced. The Office of International Trade has eased export controls for principal grades of pulp. At the same time a Federal Maritime Board examiner has recommended that Swedish steamship lines be required to eliminate the extra charge in rates on pulp delivered at New York and Newark. Whether the rate to other ports will be increased, or those to New York and Newark lowered, is left to the lines.

Newsprint and politics

Congress has again demonstrated that as far as Senators and Congressmen are concerned, there is only one grade of paper—newsprint. The Senate Subcommittee on Newsprint has recommended various steps to give the newspapers, with their tremendous political influence, larger supplies of newsprint. Among the suggestions are legislation to assist publishers to form cooperatives to produce paper, including government long-time credits to finance such combines from money levied on taxpayers. A preliminary report that the committee would recommend steps to curtail advertising stirred up so much opposition in the Senate that it never appeared in the formal report. Meanwhile, the government, through its development of defense areas, is threatening to take out of the available acreage large territory on which paper mills in the South had hoped to develop permanent raw material sources.

Another round in the upward cycle of price changes may result from the decision by the Interstate Commerce Commission to establish a flat 15 per cent rate boost for the 6 to 9 per cent increases granted last August. This is the 12th freight rate increase since the end of World War II.

Government vs. private power

The Missouri River floods have given the President a chance to demand more strongly the establishment of a Missouri River development program resembling that of the T.V.A. He stated that the federal power program is now the target of one of the most vicious propaganda barrages in history, aimed at restoring the unlimited right of private monopoly to exploit the nation's water power resources.

Two international phases in the newsprint situation developed during the month. Congressman Celler has introduced legislation to require that domestic corporations with subsidiaries abroad be required to submit records under subpoena in anti-trust cases, and to require foreign corporations doing business in this country to register agreements to submit their records of business in the American market. Rather than comply with such restrictions, Canadian producers might be glad to sell much of their product in other markets at prices higher than those for the United States. Even compliance with such a law, while it would not stop Canadian newsprint sales to this market, would certainly destroy the harmony which now exists between Canadian manufacturers and United States customers. While this move against Canadian operations is in the making, the Inter-American Press Association in session at Panama City discussed a newsprint pool to be underwritten in the United States to supply United States newsprint to Latin American countries.

Financial reports

Paper mill securities experienced a drop during the month paralleling the generally lowered prices for all securities in the securities markets. At the same time, however, there was a tendency toward higher prices for the preferred issues to hedge against the depreciation in value of the common stocks.

Net incomes

Anglo-Canadian Pulp & Paper Mills, Ltd.—Net income for 1951 was $4,246,134, compared with $3,014,251 in 1950.

Brown Co.—Net earnings for 12 weeks ended February 23 were $1,562,647, compared with $1,890,510 for the same period last year.

Certain-teed Products Co.—Net income for 1951 was $5,060,153, as against $6,380,009 in 1950.

Clopay Corp.—Net earnings for 1951 was $286,902, as compared with $275,717 for 1950.

Consolidated Paper Co.—Net profit for 1951 was $2,477,525, as compared to $2,730,254 in 1950.

Consolidated Paper Corp. Ltd.—Net profit for 1951 was $12,905,574, as against $12,113,660 in 1950.

Consolidated Water Power & Paper Co.—Net income for 1951 was $4,645,882, compared with $4,530,124 in 1950.

Container Corp.—Net income for the first quarter of 1952 was $2,778,000, as compared with $3,996,000 for the same quarter in 1951.

Continental Diamond Fibre Co.—Net income for 1951 was $1,234,078, as compared with $1,565,657 in 1950.

Cornell Paperboard Products Co.—Net income for 1951 was $1,631,349, compared with $1,493,485 in 1950.

Crown-Zellerbach Corp. — Net income for the nine months ended January 31 was $17,867,472, as compared to $17,700,922 for the comparable period a year ago.

Dennison Mfg. Co.—Net Income for 1951 was $2,119,568, as compared with $2,238,138 in 1950.

Dixie Cup Co.—Net profit for the year ended December 31 was $2,715,875, as compared with $2,914,554 in 1950.

Donnacona Paper Co. Ltd.—Net profit in 1951 was $1,644,965, against a 1950 net of $1,688,858.

Donohue Bros. Ltd.—Net profit in 1951 was $905,286, against $825,805 for 1950.

Eddy Paper Co., Ltd.—Net income for 1951 was $1,406,694, compared with $1,247,330 in 1950.

Fraser Companies-Ltd.—Net profit for 1951 was $5,433,663, as against $4,474,634 in 1950.

Gair, Robert, Co., Inc.—Net income for the first quarter was $1,279,966, compared with $2,066,135 for the same period last year.

Gaylord Container Corp.—Net income for 1951 amounted to $8,716,000, compared with a net income in 1950 of $6,882,000.

General Box Co.—Net income for 1951 was $1,135,038, as compared to $877,582 for 1950.

Great Lakes Paper Co., Ltd.—Net profit for 1951 was $4,634,369, compared with $2,770,781 in 1950.

Great Northern Paper Co.—Net income in 1951 was $4,738,427, as against $4,319,961 in 1950.

Hammermill Paper Co.—Net income in 1951 was $1,808,900, as compared with $2,014,395 in 1950.

Hinde & Dauch Paper Co.—Net income in 1951 was $3,478,632, as against $3,577,333 in 1950.

Hinde & Dauch Paper Co. of Canada Ltd.—Net income for 1951 was $1,434,094, compared with $1,265,264 for 1950.

Hoberg Paper Mills—Net income for 1951 was $975,925, as against $1,004,301 in 1950.

Hollingsworth & Whitney Co.—Net income for 1951 was $3,762,862, compared with $2,025,976 in 1950.

International Paper Co.—Net income for 1951 was $56,819,172, as compared with $66,647,151 in 1950.

Keyes Fibre Co.—Net income for the first quarter was $244,125, as against $414,052 in the corresponding period in 1951.

Kimberly-Clark Corp.—Net income for the year ended January 12 was $12,111,734, compared with $11,773,216 for the previous fiscal year.

Lily-Tulip Cup Corp.—Net income for 1951 was $3,106,330, compared with $3,450,237 in 1950.

Marathon Corp.—Net income for the year ended November 30 was $1,905,081, as against $1,903,574 for the previous fiscal year.

Masonite Corp.—Net income for six months ended February 29 was $1,840,907, as compared with $1,236,979 in the comparable period for the previous year.

Mead Corp.—Net profit for 12 weeks ended March 23 was $1,195,260, as compared with $1,616,797 for the same period in 1951.

Minnesota & Ontario Paper Co.—Net income in 1951 was $5,432,438, as against $5,260,462 in 1950.

Moore Corp., Ltd.—Net profit for 1951 was $5,413,011, compared with $4,765,439 in 1950.

Munising Paper Co.—Net income for 1951 was $363,096, compared with $451,352 in 1950.

National Container Corp.—Net income for 1951 was $8,617,000, as compared to $6,658,496 in 1950.

National Folding Box Co., Inc.—Net profit for 1951 was $707,164, compared with $760,134 in 1950.

National Gypsum Co.—Net profit for 1951 was $7,395,983, as against $9,286,528 in 1950.

Northern Paper Mills—Net earnings for 1951 totaled $1,276,028, compared with $1,613,624 for 1950.

Olin Industries, Inc.—Net income for 1951 was $12,108,673.

Oswego Falls Corp.—Net income in 1951 was $1,154,178, as against $1,290,968 in 1950.

Oxford Paper Co.—Net income in 1951 was $3,047,312, as compared with $3,234,327 in 1950.

P. H. Glatfelter Co.—Net income in 1951 was $792,493, as against $919,939 in 1950.

Price Bros. & Co.—Net profit for 1951 was $8,568,558, compared with $9,237,564 in 1950.

Puget Sound Pulp & Timber Co.—Net income for 1951 was $3,578,923, compared to $3,601,799 in 1950.

River Raisin Paper Co.—Net profit for 1951 was $719,652.

Robertson Paper Box Co.—Net income for 1951 was $352,514, compared with $509,977 in 1950.

Rolland Paper Co. Ltd.—Net profit for 1951 was $338,324, compared to $364,147 in 1950.

St. Croix Paper Co.—Net income for 1951 was $882,838, as against $1,131,880 in 1950.

St. Lawrence Corp., Ltd.—Net income for 1951 was $9,247,477, compared with $8,270,870 in 1950.

St. Regis Paper Co.—Net income for the quarter ended March 31 was $3,504,599, as against $4,836,486 for the same quarter in 1951.

Scott Paper Co.—Net 1951 income was $10,886,311, as compared with $12,493,397 in 1950.

Seaboard Container Corp.—Net income in 1951 was $1,010,063, as against $811,664 a year ago.

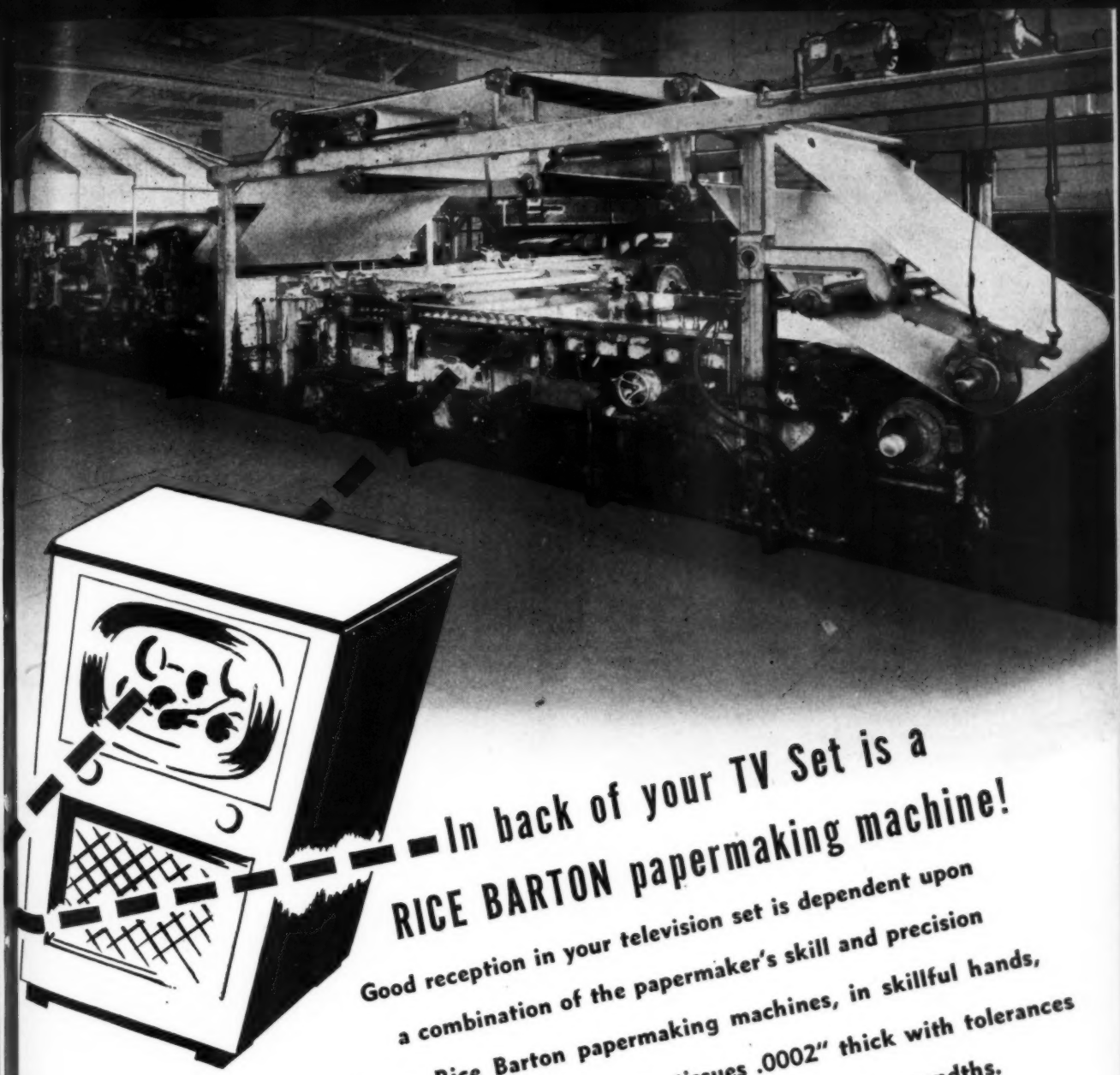
Shellmar Products Corp.—Net income for 1951 was $2,067,395, compared with $2,562,712 during 1950.

Smith, Howard, Paper Mills, Ltd.—Net profit for 1951 was $4,914,725, compared with $4,546,007 in 1950.

Southern Advance Bag & Paper Co.—Net income for 1951 was $2,827,795, compared with $2,579,544 in 1950.

Dividend declarations

Celanese Corp. of America has declared a dividend of 75 cents per share on the common stock, payable March 22 to stockholders of record March 7. Also declared was a regular quarterly dividend of $1.12½ per share on the 4½ per cent preferred stock series A, and a regular quarterly dividend of $1.75 per share on the 7 per cent second preferred



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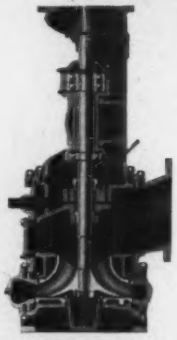

GOULDS Fig. 3115
Backwall ejector vanes on impeller prevent binding of stock behind the impeller . . . also give hydraulic thrust balance.

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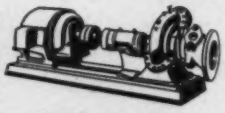
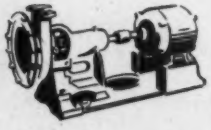
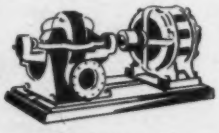


GOULDS Fig. 3105
Heavy duty, open impeller horizontal centrifugal pumps designed for handling paper stocks. Capacities up to 4000 G.P.M. Heads up to 220 ft. Send for Bulletin 723.1.



GOULDS Fig. 3705
Stainless steel pumps for handling acid and alkaline liquors. Capacities up to 600 G.P.M. Heads up to 160 ft.



GOULDS Fig. 3450
These double-suction, single-stage Goulds centrifugals will handle up to 15,000 G.P.M. Heads up to 500 ft. Ask for Bulletin 721.2.

MEMBER

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Seneca Falls
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stock, both payable April 1 to stockholders of record March 7.

Consolidated Paper Co. has declared a dividend of 50 cents a common share, payable June 2 to record of May 19.

Crown Zellerbach Corp. has declared an extra of 30 cents and a quarterly dividend of 75 cents on the common, both payable April 1 to stock of record March 13.

Crystal Tissue Co. has declared a regular quarterly dividend of 15 cents a share on common stock, payable March 31 to holders of record March 21.

Eddy Paper Co. has declared a dividend of $2.00 on common stock, payable March 12.

Gaylord Container Corp. has granted a 5 per cent stock dividend to holders of stock on March 26.

National Container Corp. has declared the regular quarterly dividend of 25 cents per share on its common stock, payable June 10 to stockholders of record May 20. Also declared was the regular quarterly dividend of 31¼ cents per share on the $1.25 convertible preferred stock, $25 par value, payable June 10 to stockholders of record May 20.

St. Regis Paper Co. has declared a regular quarterly dividend of 25 cents a share on the common stock, payable June 1 to stockholders of record May 2. Also declared was the regular quarterly dividend of $1.10 per share on the preferred stock, payable July 1, to holders of record June 6.

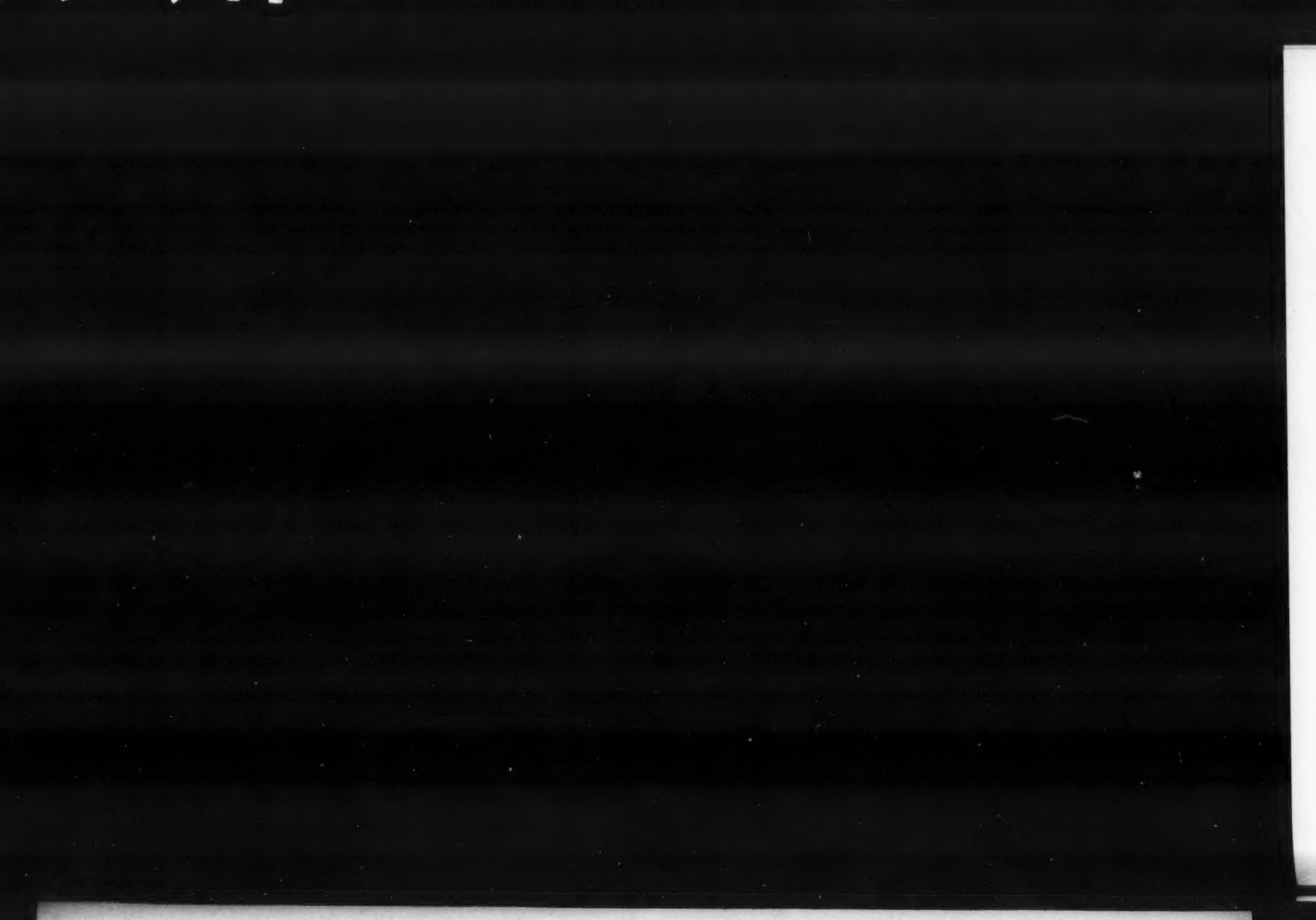
Simplex Paper Co. has declared a quarterly dividend of 25 cents a common share, payable March 20 to record of March 10.

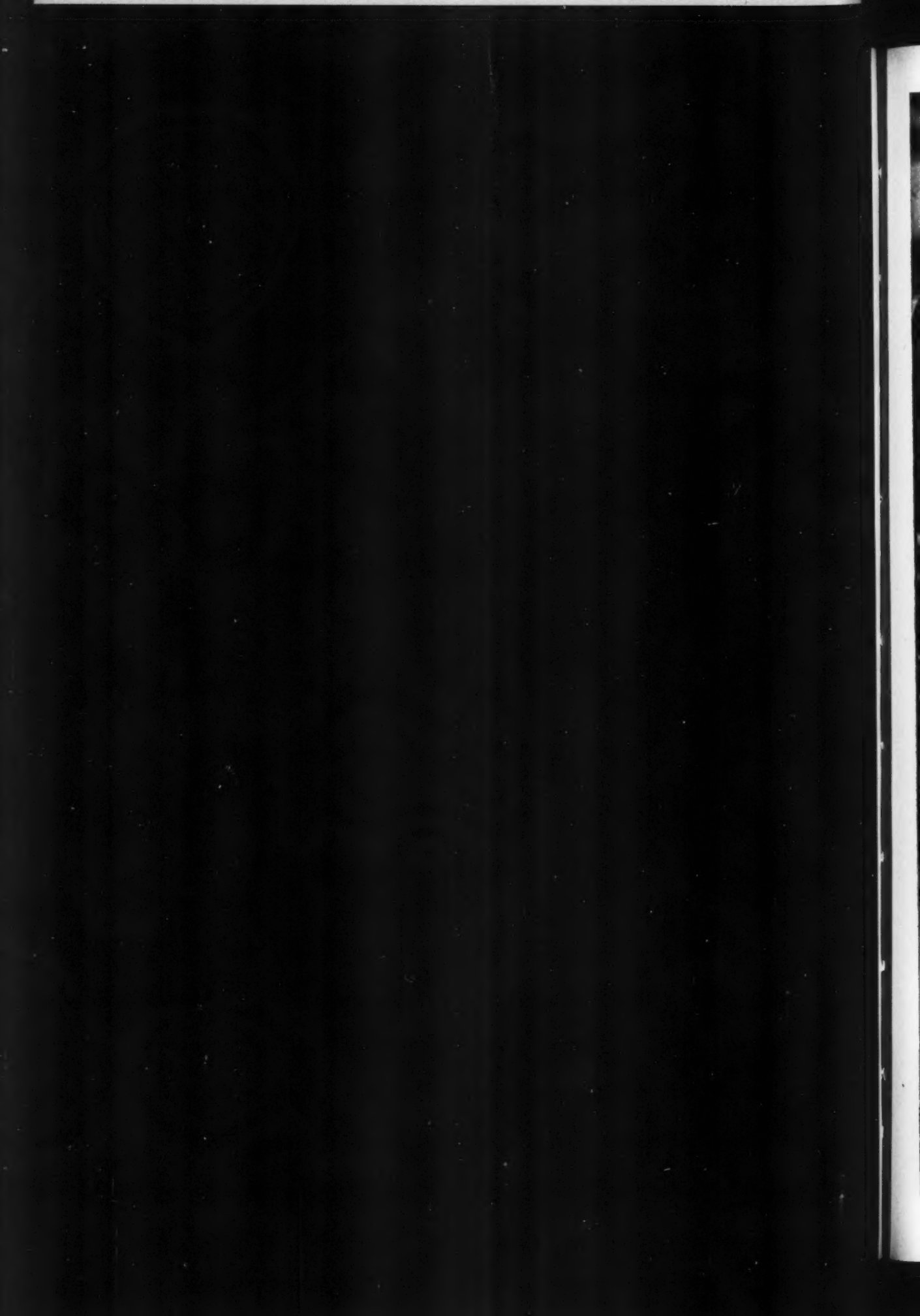
Paper mill corporate changes

Carpenter Paper Co. has registered 60,000 shares of $1 par common stock with the Securities and Exchange Commission. Worth about $1,500,000 after giving effect to a stock split, the offering will be made through Kidder, Peabody & Co., Kirkpatrick-Pettis Co. and associates. Proceeds will go into working capital.

Gair, Robert, Co., Inc. has authorized an increase in the number of common shares to 3 million shares from 1,900,000 and approved an agreement with Owen-Illinois Glass Co. to acquire the Owens American Coating Mills division. Owens will receive for coating mills 400,000 shares of Gair common and an estimated cash amount of $3,200,000.

Hoberg Paper Mills, Inc. has registered 80,000 shares of its $25 preferred stock with the Securities and Exchange Commission. The stock will be offered for public sale through an underwriting group headed by Robert W. Baird & Co. Proceeds from the sale will be used





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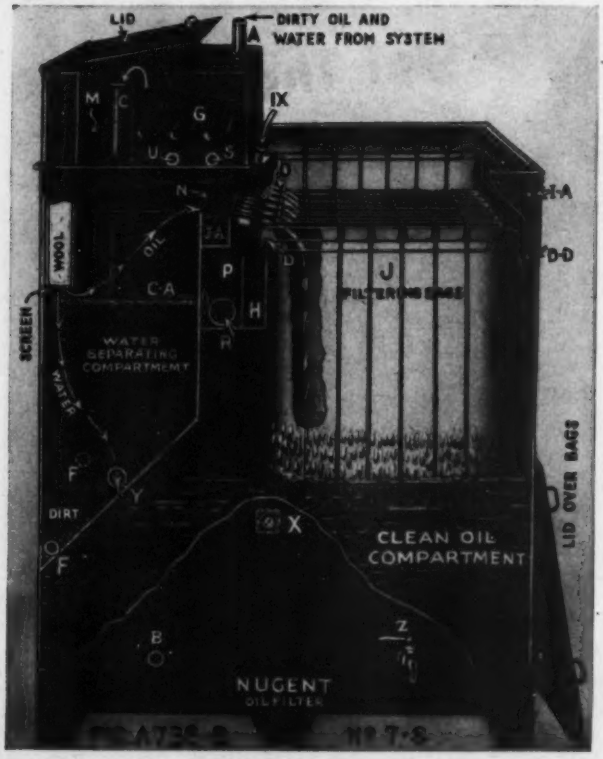

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by the company to redeem about 6,630 shares of its 6 per cent preferred stock, at a redemption price of $105 per share, plus accrued dividends. The balance of the proceeds will be used as working capital.

Mead Corp. has borrowed $2,300,000 from First National Bank of Chicago and Northwestern Mutual Life Insurance Co. Due serially July 1, 1963 through 1966, the notes provide money for additions and for working capital.

National Gypsum Co. has approved an increase in the company's capitalization from 2½ to 5 million shares of common stock. A restricted stock option plan for executives (involving 50,000 shares) was also approved.

Sonoco Products Co. has sold 150,000 shares of $5 par common stock through joint operations of a group of financiers.

Southern Paperboard Corp., a subsidiary of the Robert Gair Co., has issued $9,300,000 in 4 per cent first mortgage bonds to the Mutual Life Insurance Co. The loan was made to consolidate funded debt into a single issue and to provide funds for expansion and improvement.

St. Regis Paper Co. has sold 69,000 more shares of common stock to Time, Inc., which last year held 250,000 shares, thus increasing Time, Inc.'s holdings to 319,000 shares. Time, Inc., however, reduced its holdings of St. Regis preferred stock from 47,000 shares in 1950 to 21,350 shares.

New York Stock Exchange—Stocks
Closing Prices

	Apr. 21, 1952	Mar. 20, 1952
A.P.W. Products	* 5⅜-5⅞	* 5⅞-6⅛
Celotex	19	18⅝
Same Preferred	* 16⅜-16⅛	16½
Certain-teed Products	16¼	15⅞
Champion P. & F. Co.	25¼	26½
Same Preferred	103⅝	*102⅛-103
Chesapeake Corp.	* 32-32½	33½
Continental Diamond	13	13⅜
Container Corp.	33⅜	34⅜
Same Preferred	*102-103½	*100-102
Crown Zellerbach	54	56
Same Preferred		102
Dixie Cup	33¼	32½
Eastern Corp.	21½	23⅜
Robert Gair	13⅜	18⅜
Same Preferred	19⅜	* 19⅜-19⅞
Gaylord Container	29	29
International Paper	44⅜	46½
Same Preferred	*102½-104½	*100⅜-103
Kimberly-Clark	42⅜	46⅜
MacAndrews & Forbes		41⅜
Marathon	24½	26⅜
Masonite	29½	31¼
Mead Corp.	24¼	25½
Same Preferred	* 92-92½	92½
National Container	12¾	13⅜
Rayonier, Inc.	† 27⅞	28½
Same Preferred	* 36¼-37	* 36¼-36½
Scott Paper	50⅜	51⅜
Same $3.40 Preferred	84	* 91-92
Same $4 Preferred	*102¼-105	*102¼-102⅝
St. Regis	22⅞	21¼
Same Preferred	* 92¼-93½	91¼
Sutherland Paper	* 23-23¼	23¼
Same Preferred	*106¼-106¾	106¾
Union Bag & Paper	47¼	46⅜
United Board & Carton	* 14⅝-15¼	* 15¼-16
United Wall Paper	3⅛	3
Same Preferred	24¼	* 24¾-25¾
U.S. Gypsum	110⅜	110⅞
Same Preferred	*173½-175	*172-175
West Virginia P. & P. Co.	74	* 73-75
Same Preferred	*107⅝-108	108

New York Stock Exchange—Bonds

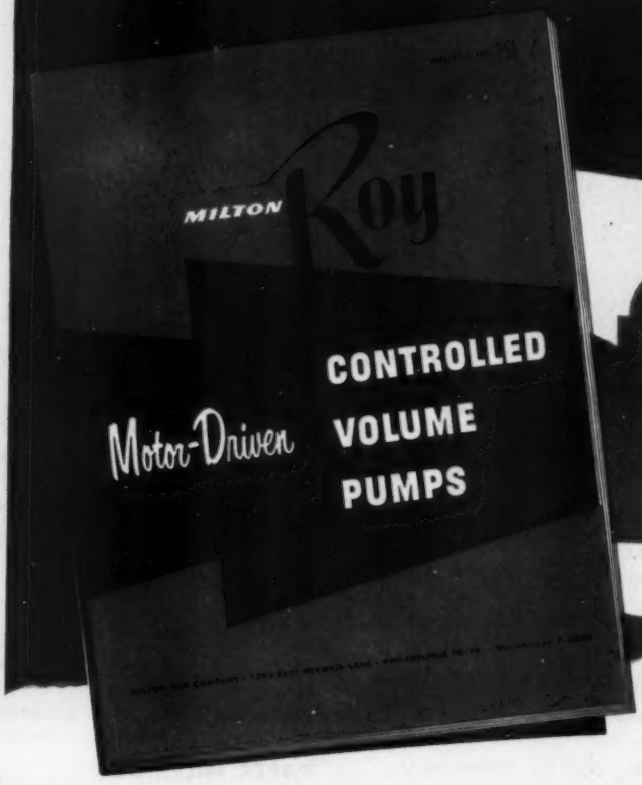
Celotex 3½%	.....	.....	100
Champion P. & F. Co. 3%	.....	.....	101⅛
Mead Corp. 3%	.....	.....	99

New York Curb Exchange—Stocks

Am. Writing	.....	.....	11⅛
Great Northern	58⅛	57⅝	
Hammermill	.....	.....	.....

* Closing Bid and Asked Prices
† New

Motor-Driven CONTROLLED VOLUME PUMPS



Complete Information In These Pages

What *are* Milton Roy Motor-Driven Controlled Volume Pumps? What materials do they pump? How and where are they used? What different designs and models are available?

The answers to these questions and many more can be found in Bulletin No. 251. This illustrated, 24-page, 2-color bulletin is full of important details. Here is a preview of some of the subjects which are discussed:

- a description of various Milton Roy Motor-Driven Controlled Volume Pumps—the Simplex, Duplex, Constametric, "Titronic," and "miniPump."
- an explanation of the exclusive Milton Roy Liquid End Step-Valve design. This information is useful because it describes the "how" and "why" of this unique non-clogging, self-cleaning liquid end.
- a description of pump capacity regulation by *plunger stroke* adjustment, including screw adjustment, micro adjustment, motorized micro adjustment.
- details on pump capacity regulation by *plunger speed* adjustment, including speedranger adjustment, "Thymotrol" adjustment, Link Belt P.I.V. adjustment.
- data on where Milton Roy Motor-Driven Controlled Volume Pumps can be used.
- capacity-pressure selection tables are included.

If your operations call for pumping liquids in accurately measured volume in amounts as low as 3 milliliters per hour or as high as 50 gallons per minute, we're sure Bulletin No. 251 will be of value to you. For your free copy, write the Milton Roy representative listed in your local classified telephone directory. Or, write directly to us.

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The Paper Industry News of the Industry

North American Newsprint Production at Record High in 1951

Despite an apparent tendency for consumption in the United States and Canada to move in a generally horizontal direction, demand for newsprint elsewhere expanded during 1951, with the result that the North American industry again was impelled to put forth maximum productive efforts. Such efforts resulted in the greatest output of newsprint on record, according to the annual report issued recently by the Newsprint Service Bureau.

Continental newsprint producers last year attained a new high output mark of 6,642,000 tons. Production in this sixth successive record year was 348,000 tons, or 5½ per cent, greater than the previous peak of 1950. It was 1,364,000 tons, or nearly 26 per cent, more than was attained in 1946—the first year in which the prewar high was surpassed.

Newsprint production in the United States in 1951 was greater than in any of the preceding 20 years. It amounted to 1,125,000 tons and exceeded output in 1950 by 110,000 tons and also represented a recovery of more than 400,000 tons from the low point in 1944. Despite the expansion of newsprint production in the U.S. in recent years, an approximation of the 1926 peak output (1,684,000 tons) does not appear to be an imminent possibility.

In 1951 the curve of newsprint production in Canada (including Newfoundland) penetrated new high ground, as it also had done in each of the preceding five years. The 5,516,000-ton output—nearly five times that of the U.S.—exceeded the 1950 total by 238,000 tons, or 4½ per cent, and that of 1946 by more than 1,000,000 tons.

Peak Capacity

As has been customary since 1947, the newsprint mills in the U.S. and Canada in 1951 operated not only in excess of theoretical capacity but also achieved the highest ratio of production to capacity on record. During the past year U.S. mills operated at 107.1 per cent of capacity, while the corresponding figure for Canada was 102.9. In 1950 the ratios were 102.3 and 101.0 respectively.

In 1951 Canada's newsprint capacity was nearly double that of 1927, while mills in the U.S. regularly producing newsprint were rated at 1,050,000 tons, or less than 60 per cent of the 1927 total. Of the 1951 estimated world newsprint capacity of some 10,500,000 tons, Canada and the U.S. combined account for more than 60 per cent. The unusually high ratio of U.S. production to capacity in 1951 is due primarily to the fact that the production total included considerable tonnage made by nonregular newsprint producers.

Increase for 1952

Canadian capacity will be augmented in 1952 by the expected completion of a one-machine mill being built in British Columbia, which is to have an original annual rating of 70,000 tons. In the U.S., except for one machine replacing older equipment and the reconversion to newsprint of a small mill, no additional facilities appear to be in prospect for this year. A number of applications for certificates of necessity in connection with proposed expansion of newsprint capacity in this country have been filed with the Defense Production Administration, which recently added newsprint along with other paper, paperboard and pulp to its priority list. This action, however, does not guarantee the availability of scarce construction materials, and no definitie official decisions concerning these applications have yet been announced. One of the proposed projects would involve the erection of a completely new mill, while others contemplate expansion of existing plants.

Shipments, Mill Stocks

Peak newsprint output in 1951 also resulted in record shipments, which for all North American mills in the aggregate amounted to 6,629,000 tons, or 99.8 per cent of production, and exceeded those of 1950 by 301,000 tons. Shipments from U.S. mills were slightly greater than production, while movement of newsprint from producing centers in Canada was approximately 13,000 tons below output.

As indicated in the foregoing discussion of shipments, there was a small lag therein in relation to production that was reflected in a 12,000-ton rise in producers' stocks at the end of 1951 from the preceding year's level. In total, North American manufacturers' stocks amounted to 109,000 tons on December 31, 1951, compared with the 97,000-ton record low a year earlier and the 132,000 tons at the end of 1949. Despite the increase over 1950, producers stocks were still below the year-end average during the postwar period to date and also less than half the tonnage held in 1939 and 1940.

Exports

Exports of newsprint paper from Canada in 1951 again occupied a position of prime importance in the Dominion's foreign trade. According to data compiled by the Dominion Bureau of Statistics, the value thereof in 1951 amounted to $536,374,000 and represented an in-

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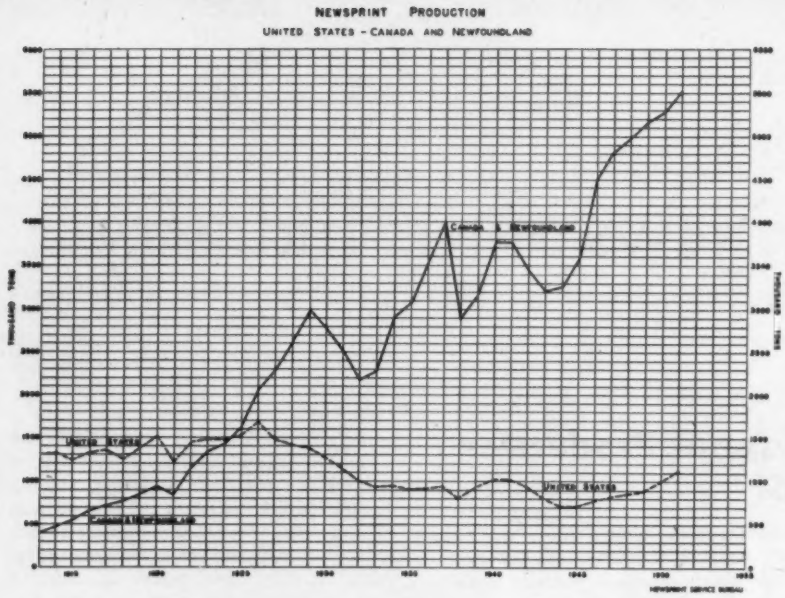


crease of 10 per cent over 1950. The value of exports to the Uniited States was $496,849,000, while those to all other markets amounted to $39,525,000. Compared with 1950 values, there was an increase of $33,810,000 in exports to the former and one of $16,818,000 to the latter.

In terms of physical volume, exports of newsprint from Canada in 1951 also were of record proportions and amounted to 5,112,000 tons, of which 4,775,000 tons went to the U.S. and 337,000 tons went to destinations elsewhere throughout the world. Exports to the U.S. were 51,000 tons, or 1 per cent, greater than the hitherto peak volume in 1950, while overseas exports were 123,000 tons, or 57 per cent, above the 23-year low level of 1950.

For the U.S., export data were not complete at the time the N.S.B. report was released. However, on the basis of Department of Commerce figures for the first 11 months, the total for the year should approximate 65,000 tons. This would indicate an increase over 1950 exports of about 21,000 tons, or 47 per cent. With the exception of 1941, exports of newsprint from the U.S. last year were at the highest level since 1919.

On the basis of incomplete data, it would appear that exports of newsprint from North America in 1951 may have totaled more than 400,000 tons. Although this would indicate an increase of more than 140,000 tons over the 258,000 tons exported in 1950, exports were still considerably below the volume of preceding postwar years. With imports from overseas estimated at 205,000 tons, the North American net export balance in 1951 amounted to less than 200,000 tons and, except for 1950, was smaller than in any year since 1927.

Imports

As in the case of newsprint exports from the U.S., complete 1951 data on imports into this country were also unavailable for the N.S.B. report. A projection of official data for the first 11 months rounds up to a record high of 4,985,000 tons, or 121,000 tons more than in 1950. Of this total, it is estimated that about 205,000 tons came from Europe, while the balance originated in Canada. The indicated 1951 total of imports from Canada is the largest on record, while imports from overseas, although 20 per cent higher than in 1950, were 50,000 tons less than in 1949.

On the basis of the 11-month totals, more than three-quarters of the imports from overseas originated in Finland, while Sweden supplied 15 per cent and Norway 4 per cent. Imports from France and Belgium accounted for the balance. Imports from France were about 7½ times the 1950 volume, while those from Sweden and Norway recorded increases of 72 per cent and 62 per cent respectively.

Imports of newsprint into the Uniited States in 1951 represented 82 per cent of the new supply available to consumers, while domestic production minus exports supplied 18 per cent.

Consumers' Stocks

There was in 1951 a substantial rise in the volume of newsprint held by U.S. consumers. The quantity of newsprint on hand or in transit to the newspapers reporting to the American Newspaper Publishers Association—which consumed an estimated 75½ per cent of the total tonnage used last year—amounted to 522,000 tons at the end of 1951. Except for the record accumulation of inventories at the end of 1937, the volume thereof at the close of last year was greater than ever before. This was 97,000 tons, or 23 per cent, above the 1950 figure. The significance of any level of stocks lies primarily in the relationship thereof to consumption. The 42 days' supply to which the aforementioned tonnage is converted on the basis of usage in December compares with the 33 days' in 1950, an average of 36 days' in 1946-49, 50 days' in 1942-45, and 42 days' in 1938-41.

Consumption

The spectacular postwar expansion in newsprint consumption in the U.S., which from 1946 to 1950 had grown at an average annual rate of more than 400,000 tons, in effect came to a halt in 1951. Actually, estimated total consumption did attain an all-time peak last year, but the increase over the hitherto record high of 1950 was an inconsequential one of less than 1 per cent.

The 422 publishers of 525 newspapers in the U.S. reporting to the ANPA used 4,511,000 tons of newsprint paper in 1951, or about 32,000 tons less than their 1950 record. The decline of 0.7 per cent for the year was greater than had seemed likely earlier. Despite small decreases in four of the first nine months, by the end of that period their use of newsprint had matched the record levels of 1950. However, consumption in the final quarter declined by 2½ per cent compared with the same period of 1950 and resulted in the aforementioned loss for the year. Since no corresponding decreases in sizes of newspapers or in over-all circulations was recorded, this somewhat smaller consumption may have resulted from efforts to effect economies in usage.

The rise in per capita consumption of newsprint, which began in 1945 and by 1947 had topped all previous records, established successively higher ones in the next three years to a peak of 78.4 pounds in 1950. There was a slight reversal in the trend in 1951, with a drop to 77.9 pounds.

March N. American Newsprint Output Highest on Record

Production of newsprint in Canada (including Newfoundland) during March amounted to 476,492 tons and shipments to 453,162 tons. Output in the United States was 99,633 tons, and shipments were 98,696 tons, making a total North American production of 576,125 tons and shipments of 551,858 tons, compared with continental production of 567,246 tons and shipments of 566,401 tons in March 1951. These figures, released by the Newsprint Service Bureau, show that total output in March 1952 exceeded that of any March on record.

The Canadian mills produced 53,704 tons more in the first three months of

1952 than in the corresponding period of 1951, which is an increase of 4 per cent. The output in the United States was 19,747 tons, or 7.3 per cent, greater than that in the first three months of last year, making a total continental increase of 73,451 tons, or 4.5 per cent, more than in the comparable period of 1951.

Stocks of newsprint paper at the end of March were 166,970 tons at Canadian mills and 8,452 tons at U. S. mills, making a combined total of 175,422 tons, compared with 151,155 tons on February 29, 1952, and 151,353 tons at the end of March 1951.

Bowater to Boost Newsprint Output

Sir Eric Bowater, chairman of Bowater's Pulp & Paper Corp. Ltd., said recently that his company plans expansion during the next two years that will increase its newsprint production 300,000 tons to 1,100,000 tons annually. He declared that the firm's $55,000,000 plant at Charleston, Tenn., is expected to be in operation in 1954 and will produce a yearly 130,000 tons and 50,000 tons of kraft sulphate papers from southern yellow pine.

"This production," he declared, "will go to the southern states, where the newsprint situation is tighter than it is in the North." Sir Eric said that the Charleston plant will employ about 1,000 workers.

Newsprint Pool for Latin America Approved

Directors of the Inter-American Press Association, meeting recently in Panama, adopted a proposal for a newsprint pool to aid Latin American publishers. The proposal for the pool, which would be underwritten by United States publishers, was submitted by Andrew Heiskell, publisher of *Life* and chairman of the Association's executive committee.

During the meeting the directors admitteed 29 new members, while rejecting a membership bid from the Havana Communist newspaper *Hoy*. The rejection of *Hoy* was based on the association's constitution, which requires members to support democracy and freedom of the press.

IMC Halts Newsprint Allocations

A temporary halt in its allocation of Canadian newsprint to overseas consumers was called recently by the International Materials Conference meeting in Washington, D. C. According to a spokesman for the group, the conference has collected world-wide information on newsprint that shows supply and demand virtually in balance.

"But the committee has been directed to keep free world newsprint problems under review and to recommend allocations or other action if necessary," an announcement by the IMC said.

Data collected by the conference's newsprint committee indicate that countries outside the Iron Curtain would produce 8,928,000 metric (2,204 pound) tons of newsprint in 1952 to meet a demand for 8,920,000 tons. The conference consists of representatives of governments outside the Russian sphere organized to divide equitably strategic materials in short supply.

Newsprint Notes

Canadian Government has promised to consult with OPS before boosting newsprint prices, according to OPS Adminstrator Ellis Arnall. He told Rep. Beckworth (Dem., Texas) that, as of February 27, Canada was "not contemplating such an increase."

Argentina's First Newsprint plant was to put its production on the market during April at 4,350 pesos (about $620) per ton. The mill, known as Celulosa Argentina, is located in the province of Buenos Aires. Although the plant was established some months ago, production had been stopped because of a lack of orders. Output has been resumed at the 1,000-ton monthly capacity.

National Backing in Cuba for the first plant in that country to manufacture newsprint from bagasse is being sought by the head of the Agricultural and Industrial Bank. The mill would cost between $10,000,000 and $15,000,000.

U.S.F.S. Sees Increased Growth as . . .

Forestry Activities Step Up Pace

The Forest Service has estimated that 2 billion board feet more timber will be cut in 1952 than in 1945. The recent U.S.F.S. study was made public by the Department of Agriculture and is the result of a comparison between work on national forests in the current fiscal year and the work accomplished in 1945. The survey indicates that there will be 21,500 more acres planted, 60,000 more acres reseeded to grass, and four times as many recreation visitors.

National forest receipts increased from $16,000,000 in 1945 to $57,000,000 in 1951, in which year this income exceeded expenditures by about $1,500,000. Receipts are derived from the sale of timber, grazing of livestock, special land use permits, and water rights. Expenditures include management not only of these revenue-producing resources, but also management of resources such as recreation, wildlife, and watersheds.

Pine Seed Study Covers 16 States

In addition to their regular sowing this spring, 20 forest tree nurseries in 16 southern and eastern states are planting a total of 400 special lots in southern pine in what may prove to be the most comprehensive study of geographic sources of forest tree seed undertaken.

This announcement was made by the Committee on Southern Forest Tree Improvement, headed by Dr. Carl Ostrom of the Southeastern Forest Experiment Station, Asheville, N.C. The study is in immediate charge of a subcommittee headed by Philip C. Wakeley of the Southern Forest Experiment Station at New Orleans.

The project was launched because trees raised from seed collected at various locations do not grow equally well in any one place. An earlier study demonstrated that collections of loblolly pine seed too far from the planting site might easily cost the owner of a 5,000-acre plantation the loss of $250,000 of potential growth in 20 years.

Twenty-five lumber and pulp companies, state and federal forestry agencies, and schools of forestry cooperated last fall to collect seed of four species of pine for the study. Seed was collected in 52 localities from Pennsylvania and New Jersey south to southern Florida and west to Texas, Oklahoma, and Missouri. The seed was shipped to the experiment station at New Orleans for special cleaning, over-winter storage, and distribution to cooperating nurseries.

Successful nursery stock production this summer will permit the establishment of a test plantation near each of the 52 collecting grounds. Each test plantation will compare the growth of stock from local seed with the growth of stock from seed collected at five to seven places having different soils or climate. It is expected that resulting differences in survival, growth, and disease resistance will show how to make greatly improved choices of collecting grounds for seed for forest plantations throughout the South.

Dry Weather Spurs Forest Fire Season in East

Forest fires roared over eastern woodlands during a warm, dry and windy week-end April 19 and 20. Many blazes were out of control. Valuable timber and buildings were razed in the path of

the flames in New England, New York, New Jersey, and Maryland.

A fire that started on Break Neck Ridge near Cold Spring, N. Y., raged through Sugar Loaf Mountain toward Lake Surprise, burned at least 500 acres and was out of control. A blaze on the edge of Allegheny State Park in western New York was brought under control after raging five hours. In Saratoga County, N. Y., a blaze spread over two square miles and was moving eastward.

In Massachusetts one fire centered around Wellesley, burning across 300 acres, while in Maryland a brush fire swept across flatlands in Anne Arundel County backed by 30 mph winds.

At Fairview, N. J., a fire raged in 4,000 tons of baled paper at the Southern Trucking Co. terminal. A fire official said "it may burn for days."

Wood Shortage Forecast by U. S. F. S. Head

A growing world-wide shortage of wood as a result of an increasing demand for cellulose and wood products has been forecast by Lyle F. Watts, chief of the United States Forest Service. Speaking at Nacogdoches, Texas, Mr. Watts foresaw a possible doubling of the U.S. timber production and a "tremendous future" for the pulp and paper industry.

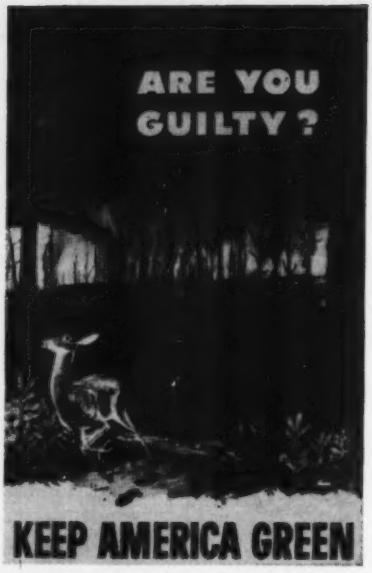
He urged more research in wood chemistry and in new uses for wood, particularly the waste and byproducts of the present industry. Calling for youth to enter forestry as a life's work, Mr. Watts declared that "the need for men trained in forestry should increase rather than diminish."

Mr. Watts reported a widespread awakening to forestry in the South. "A heavy percentage of the large industrial owners," he declared, "are practicing good management in the care and perpetuation of their forest stands." However, he had little praise for the millions of small owners, who control more than one-half of the nation's commercial stands, dubbing them the "hard core" of the forestry problem.

Likelihood of Fires Predicted in Georgia

Georgia forest rangers may soon be informed ahead of time on the likelihood of fires in any specific region. This prediction service, set up as a research project of the University of Georgia's School of Forestry and the state forestry commission, will base its fire outlook on extensive weather studies.

At 20 points throughout the state, and at 20 others to be added soon, forestry weather stations are keeping records of temperature, rainfall, wind velocity, and moisture conditions on the forest floor. When these conditions are right for a fire, the forewarned rangers will have time to gather extra fire fighting crews to prepare for an emergency.



NEW POSTER carrying forest fire prevention appeal being distributed by American Forest Products Industries, Inc., Washington, D. C.

Currently, the study in Georgia is to determine exactly what weather conditions spell fire danger. Days on which fires are likely to occur are indexed by number, with the highest numbers indicating the greatest danger. This classification system was worked out by the U.S. Forest Service and has been in use for some time in national forests and in a number of states, particularly in the East.

Laboratory Forest Fires

To protect California timberlands from the ravages of fire, miniature blazes have been set up in a University of California laboratory so that prospective fire fighters may study methods of combatting them.

Under laboratory conditions, all possible weather situations may be recreated. Fires in canyons and on mountain ridges in both heavy windstorms and quiet atmospheric conditions are set up. Fuel types as well as land and wind conditions vary in the forest fire laboratory operated by the school of forestry of the university's agricultural college. The new fire fighter sees the large timber blazes develop and then die under proper control in the laboratory miniature.

War on Beetles Awaits Congressional Approval

The beetle attack that has devastated thousands of acres of Rocky Mountain timberlands will be the primary target of the U.S. Forest Service's Denver headquarters this summer if and when Congressional approval is given to the requested $1,670,000. A U.S.F.S. spokesman has reported that the funds will make possible an all-out war on the tree-killing insects that have ruined an estimated 20,000,000 trees in the Rockies.

Rep. Jamie L. Whitten (D., Miss.), head of a House appropriations subcommittee, has indicated that there is little opposition this year to the granting of monies requested by the Forest Service. Washington sources report that the appropriations will clear both houses with little trouble.

When final approval comes, the U.S.F.S. plans to move 500 men into 13 camps in the area for the final attack on the beetles, which at one time threatened 130,000,000 trees on the insects' path from Mexico to Canada. According to Tom Brown, head of the Forest Service anti-beetle program, recruiting of the necessary men will start about June 1, with the first 400,000 trees to be sprayed when the snow melts in the high reaches of the Rockies. If 400,000 trees can be treated this summer, reports Edward P. Cliff of the U.S.F.S. Washington office, the worst of the beetle blitz will be over. About 5,000 trees, he said, would have to be treated next year, and 5,000 to 10,000 a year for a year or two afterward.

Pennsylvania Firm Purchases Chemical Girdling Patent

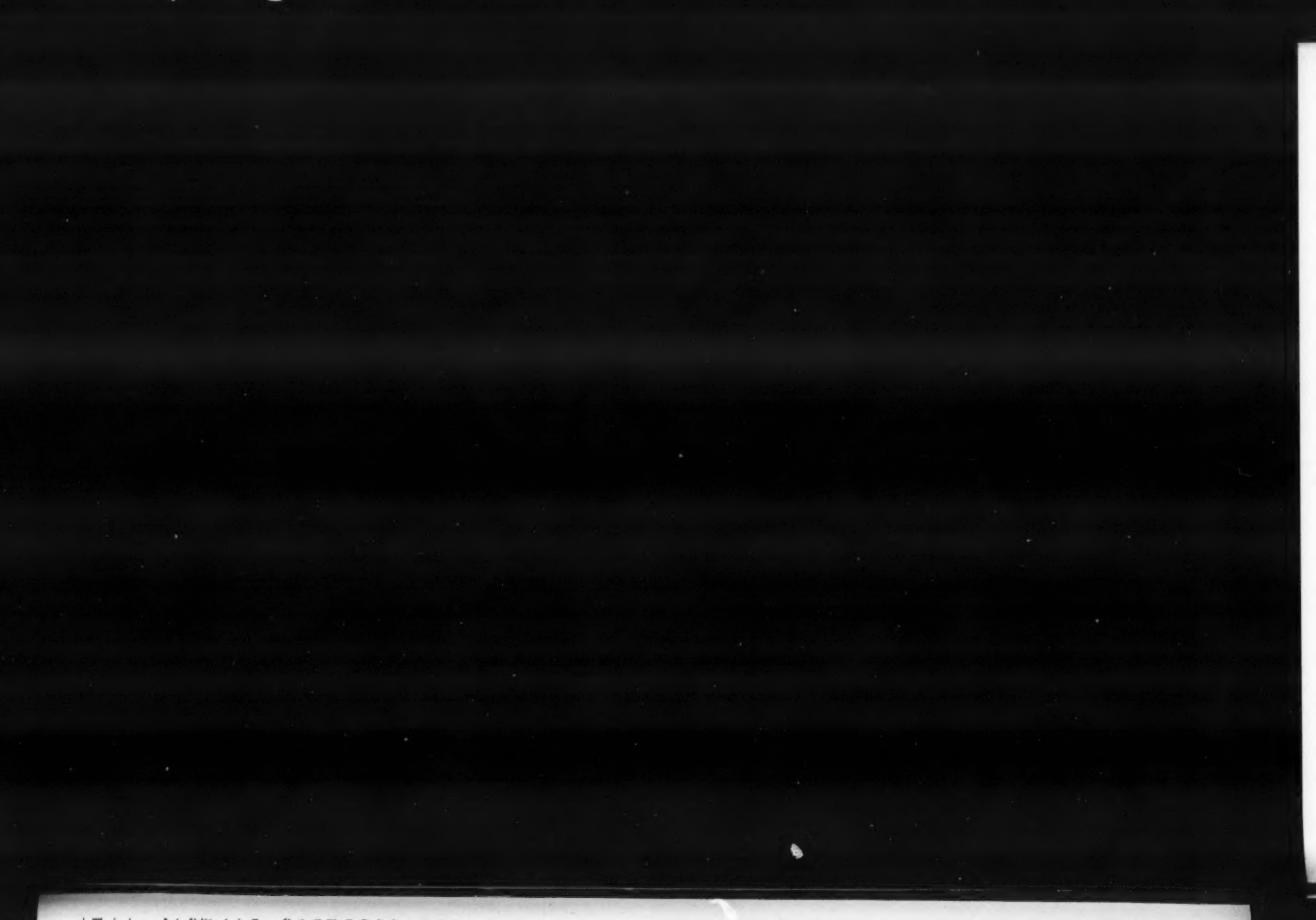
Armstrong Forest Co., Johnsonburg, Pa., has purchased patent rights for the chemical girdling of trees from Alexander R. White of Port Arthur, Ont. Mr. White held these rights under U.S. Patent No. 2,324,968, granted July 20, 1943.

According to the purchase agreement, Armstrong has dedicated the girdling process to public use. The patent right purchase was completed January 10. The firm has been experimenting with the chemical girdling of pulpwood-size trees on its Pennsylvania woodlands for several years. Through use of a sodium-arsenite solution painted on a bark girdle, selected trees are killed on the stump. The bark on treated trees loosens in from three to seven months. Use of the process extends the bark peeling season.

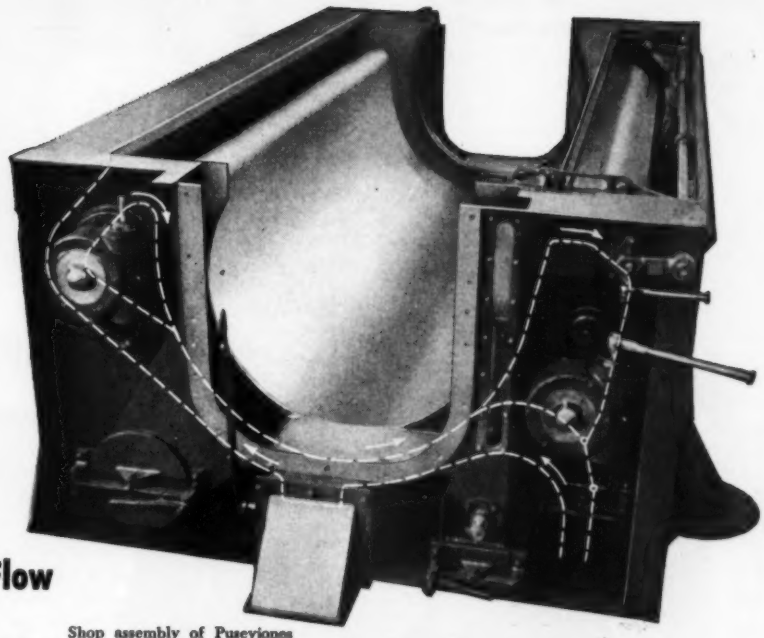
Mechanical Planters to Aid in Wisconsin Planting

Some 25,000,000 trees are to be set out in Wisconsin this spring, 3,000,000 more than in 1951. Playing a bigger role in the 1952 project than ever before will be the mechanical planters.

Foresters for Trees for Tomorrow, Inc., will use four machines in setting out 685,000 trees on 33 projects in Vilas, Oneida, Forest, Lincoln, and Langlade counties. In addition to the use of its own two planters, Trees for Tomorrow will operate machines owned by the



Let's talk Vats



Shop assembly of Puseyjones Stream-Flow Vat.

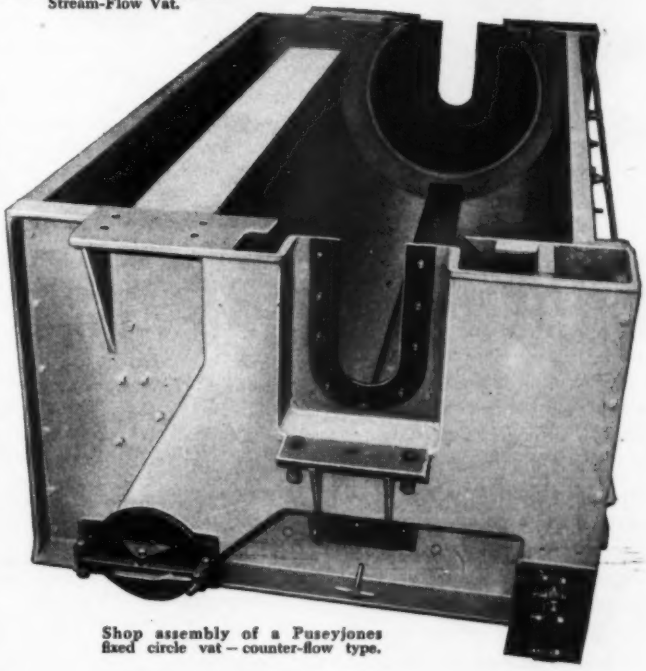
Fixed Circle or Stream Flow

Here at cylinder vat headquarters, our engineers have an experience that is unique in the Paper Industry.

If a fixed circle vat is what you need, the Puseyjones design – either counter-flow or direct-flow type – is planned to avoid the common limitations which are so costly in day-to-day operation. The fixed circles are supported in a manner to permit building them in or out as needed. The openings to the vat end chambers from inside the cylinder mold are unobstructed. There is free surface run-off of foam over the spill gates. Quick-opening wash-out doors provide easy access to all stock and white water passages.

If an adjustable circle vat is what you need, Puseyjones offers an outstanding development in the Goldsmith Stream-Flow Vat. The simple, rugged adjustable vat circle gives the papermaker a tool roughly comparable to the slice of the fourdrinier machine. Over 45 of these vats are now in operation or under construction . . . and every installation has resulted in greatly improved sheet formation and increased speed possibilities.

Let's talk cylinder vats now. A letter or a telephone call will put Puseyjones engineers at your service.



Shop assembly of a Puseyjones fixed circle vat – counter-flow type.

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The controllable bar-to-bar action of the "Slush-Maker's" rotor and bed plate (shown enlarged at right) is the answer to rapid, efficient and complete pulping and deflaking of all pulps and paper stocks—even high wet strength.

The circulating action of the rotor blades quickly blends and mixes various pulps along with color, size and other additions to the furnish.

The bar-to-bar action may be set up to give a preliminary beating treatment to the stock or to brush the color and size into the fibers.

The "Slush-Maker" completely prepares the stock for final fiber treatment in "Stock-Makers" or other beating and refining equipment.

We are prepared to run a "Slush-Maker" demonstration for you—let us know your pulping requirements.

Chicago & North Western Ry. and Rhinelander Paper Co.

Operating on other projects will be tree-planting machines bought by banks in Marathon, Taylor, and Wood counties and handled through the offices of county agents.

The 1952 Wisconsin planting is to be larger than any since World War II. Despite the fact that approximately 3,000,000 more trees were made available this year than last, the state was sold out of all varieties by January 25, with the exception of jack pine, a limited amount of 3-year-old white cedar, and a considerable number of 2-year-old Norway pine. W. H. Brener, supervisor of nurseries for the conservation department, has announced that because of the unusually heavy demand, plans are being made to raise nursery production quotas for the coming year's operations.

Lakes States Seed Crop Inadequate in 1951

Most forest trees in the Lake States produced poorer seed crops in 1951 than in 1950, the Lake States Forest Experiment Station reports. With few exceptions, according to Paul O. Rudolf, the 1951 seed crop in Minnesota, Michigan, and Wisconsin appears to have been inadequate for good natural reproduction and only poor to fair for commercial seed procurement. Mr. Rudolf is forester at the station.

Many bushels of seed for the national forests were obtained in the Lake States area. Mr. Rudolf's report shows that the only species with good seed production in central Upper Michigan was red pine. All other species bore poor crops except maple, which produced a fair crop.

800,000 Trees to be Distributed by NEPCO

Nekoosa-Edwards Paper Co., Port Edwards, Wis., will distribute 800,000 free trees to landowners in three central Wisconsin counties this spring. Species to be included in this the fourth year of the program will be Norway and jack pine.

The project was begun in 1949, when 150,000 trees were given to property owners in the area. Since then the total distributed each year has steadily grown. By the end of 1952 more than 2,000,000 trees will have been given away. In 1951 more than 500,000 seedlings were planted. The largest share went to Adams County, where 353,876 trees were distributed. The other counties sharing the gift were Wood and Juneau. The survival rate of the 1951 crop was 93 per cent.

As in previous years, Nepco's tree planter machine will be available for use by landowners who plant 2,000 or more trees. A tractor and a three-man crew will be furnished by the firm at a nominal charge of 75 cents per 1,000 trees. In addition, a trained forester will accompany the crew and equipment for counsel in proper planting, disease and insect control, and harvesting methods. Requests for the trees will again be handled through the county agents.

Minnesota Leads in Timber Cut in North Central Area

Minnesota led in the cutting of timber on national forests in the north central region during 1951, it was reported recently by Jay H. Price of Milwaukee, regional forester. A total of 123,500,000 board feet was cut in the state. Michigan was second with 72,000,000, and Wisconsin third with 62,000,000. Value of the timber cut in the region was more than $1,500,000.

Approximately 286,260,000 board feet of various forest products was taken from the area, Mr. Price said. The 1951 harvest was 68,000,000 board feet more than that of the previous year, and double the cut of 1941. The national forests of the north central region furnished 412,000 cords of pulpwood, or 21 per cent of the requirements of the Lake States pulp and paper industry for the year. Seventy-two per cent of the timber produced last year consisted of pulpwood, and the remainder was mostly sawtimber and veneer, with a small amount of post, poles, etc.

1,100,000 New Trees Planted in Washington State

At the recent close of the winter planting season, the Washington State Division of Forestry at Olympia announced that 1,100,000 trees had been started on their way to becoming part of the state's vast timberlands. One million of the two-year-old seedlings are Douglas fir. Of the remainder, 50,000 are Ponderosa or western yellow pine, a species relatively new to the Pacific slope at Washington.

According to Mike Webster, deputy state supervisor of forestry, "the Ponderosa pine is a drouth-resistant tree. We hope it will provide a timber crop in areas too dry for fir, spruce, and hemlock. If the experiment is successful, in about 50 years the trees will be large enough to be used for fancy paneling for homes, boxes for fruit, and other items."

The fir seedlings were planted in the Capitol State Forest in Eastern Grays Harbor County. It took six months to set out 1,000,000 little trees on a 1,600-acre tract. More than 6,000 acres of the forest were restocked previously.

The 1951-52 plant was relatively small, Mr. Webster reported. Since 1940 the State Division of Forestry has planted an average of 3,000,000 seedlings a year. All are grown at the state nursery near Olympia.

Import Committee Reviews 1951 Customs Cases

The work of the Import Committee of the American Paper Industry during 1951 was reviewed recently by Warren B. Bullock, manager. "The outstanding work of the committee," he said, "was in connection with unusual new types of paper products developed as a result of American research."

Of special importance was the decision on bakelite-laminated paperboard, which was taken out of the paper schedule by Customs officials and classified at the far higher rate of duty provided for products in chief value of chemicals. Similar moves are under way for other types of papers so heavily impregnated with resins or other chemicals that they fall into the field of plastics.

During the year a total of 231 new cases were brought to the attention of the Import Committee, 172 of which were protests filed in United States Customs Court against duty rates assessed by Customs officials. Decisions were favorable to the Committee's contention in 126 cases, while only 11 were decided adversely.

Issues raised during the year involved every basic paper and paperboard. The cumulative effect of duty rate reductions granted by reciprocal trade agreements resulted in imports of a dollar value of $26,000,000, or nearly twice the $14,000,000 of 1950. The tonnage increase in paperboard was 15 percent. In some grades of paper the increase was 100 per cent. Imports of printing paper increased 30 per cent in tonnage over 1950.

Current Customs Cases

Imports of a wide variety of types of lamp shade stock are currently before the Customs officials, for classification, according to Mr. Bullock. Some of the imports are unquestionably dutiable as Bristol, with rates varying according to the value and whether or not the board is embossed or decorated. Other types outside the Bristol field are being classified as paper not specially provided for at rates higher than those for Bristol. Some unusual types are being offered, however, in which a base of paper is decorated with shreds of other fibers and the whole sheet impregnated with glue. Still another type is paper with a layer of cellulose acetate. In this case the Import Committee is taking the position that the presence of acetate as the component of chief value should justify its classification as a chemical product at rates much higher than those for any grade of paper.

Cases decided by Customs officials in-

clude the following: Foil covered paperboard for insulation purposes, imported on the Pacific Coast from Canada, held to be dutiable in chief value of aluminum, not at the lower rate for metal coated paperboard; Italian box cover paper claimed to be dutiable at 1½ cents per pound and 7½ per cent as handmade paper, classified for duty as uncoated machine-made surface decorated paper at 4½ cents per pound and 10 per cent; cross section graph classified for duty as ruled writing paper, not at the lower rate for printing paper.

New cases before Customs officials include the following: Tissue paper heavily impregnated with phenol resin for use as a laminating agent for sheets of plywood, under investigation to determine whether it is dutiable as paper or as a chemical product; multiwall bags from Canada under study to determine whether they are articles of reinforced paper, one layer being asphalted kraft; fancy paper for cosmetic wrappings claimed to be dutiable as coated paper, believed to be dutiable at the higher rate for decorated uncoated paper; paperboard imported from Finland at Philadelphia believed to be undervalued and misclassified.

Sports Theme of New Eastern Corp. Ads

Eastern Corp, Bangor, Maine, has embarked on an advertising program built around the keen interest of the American public in sports of all kinds. The firm has recently announced that Grantland Rice, known as the "dean of American sports writers," will select his "all-time greats" for a series of advertisements that will appear in national and trade publications, as well as in direct-mail promotion, which the company will tie in with its space advertising. The ads, to appear in *The Saturday Evening Post, Time, U. S. News, Business Week, Printers' Ink* and many printing and office management publications, will be geared to the various sports seasons.

First Manistique Paper on Way to South America

The first shipment of publication grade paper from the Manistique Pulp & Paper Co. mill, Manistique, Mich., to South American countries was announced recently by R. G. Hentschell, manager. The initial shipment of several carloads was made in March.

Production of paper for South American publishers was instigated by Trenton Times Corp., new owner of the mill. The project will be continued on a somewhat curtailed schedule until July 1, Mr. Hentschell declared. Approximately 1,000 tons will be produced monthly for South American shipment, with the remainder of the production filling contracts with Mead Corp.

Pulp, Paper Expansion Goals Listed as . . .

New Construction, Modernization Projects Undertaken in Industry

The Defense Production Administration in Washington has recently revealed current expansion goals for wood pulp, paper, and paperboard. Action on applications pending for certificates of necessity for rapid tax amortization may now be completed by the DPA Office of Resources and Expansion.

The January 1, 1956, expansion goals set for the industry, as compared with January 1, 1951, capacity, are as follows: *Paper,* additional expansion of 1,483,000 short tons to increase annual capacity to 14,268,000 tons from 12,785,000 tons; *Paperboard,* additional expansion of 895,000 tons to increase annual capacity to 13,030,000 tons from 12,135,000 tons, and *Wood Pulp,* additional expansion of 3,313,000 tons to increase annual capacity to 19,048,000 tons from 15,735,000 tons.

However, according to DPA, since the expansion goals in the pulp, paper, and paperboard industries have been filled in the aggregate, either by necessity certificates already certified or by applications pending, no more such applications will be accepted. Some additional expansion is to be encouraged, however, for newsprint, fine papers, white pulp, groundwood pulp, and groundwood, machine-coated and book paper.

Buckeye Cellulose Corp. Plans $20 Million Mill

Proctor & Gamble Co. has announced that contracts have been awarded for the planned new $20,000,000 Foley, Fla., plant of its subsidiary, Buckeye Cellulose Corp. A certificate of necessity authorizing accelerated amortization of construction costs has been granted the firm.

The mill, which is designed to produce approximately 300 tons of pulp per day, is to be completed in January 1954. Approximately one-half of the cellulose pulp produced will have as its raw material timber from a 565,000-acre tract recently purchased by P & G. H. K. Ferguson Co., Cleveland, and Duvall Engineering & Contracting Co. of Jacksonville, Fla., will build the plant.

Southern Paperboard Begins $5,000,000 Expansion

Expansion to increase daily production to 625 tons has been announced by Southern Paperboard Corp. at Port Wentworth, Ga. The project, to cost approximately $5,000,000, was reported by George E. Dyke, president.

The program will provide reserve facilities that should, according to Mr. Dyke, materially reduce loss of production from shut-downs for repair and maintenance.

While structural additions will be made to several buildings and the yard facilities expanded, no basic changes are to be made in the paper machine. The original design, which proviided for a second machine and the necessary auxiliary facilities it required, will not be changed. The project, to be completed in late 1953 or early 1954, is planned so that normal mill operations will not be disrupted. The National Production Administration has granted authorization for the construction and has made an allotment of controlled materials for this purpose.

Operating Personnel Named

In his announcement, Mr. Dyke reported the election of three officials who will be directly concerned with the new plant. These are: Charles M. McCarthy, to be vice president and plant manager; Claude M. Adams, to be general superintendent, and Thomas Coats, to be assistant secretary. Mr. Dyke also announced the appointment of C. S. Huestis, New York, N.Y., to be vice president and assistant to the president.

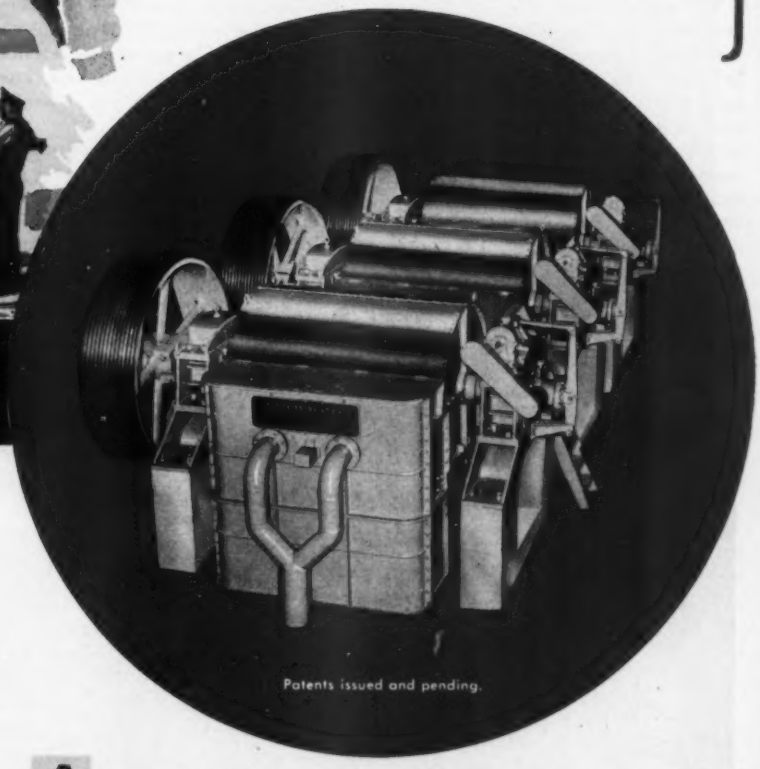
Mr. McCarthy, a native of Canton,

Charles M. McCarthy

Claude M. Adams

Thomas Coats

highest quality
high tonnage production



Patents issued and pending.

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A Multi-Roll *Controlled Flow* VICTORY BEATER recently set a record that has become the standard of highest achievement in the paper industry. For two solid years, 24 hours a day, 7 days a week, this powerful, triplex high tonnage unit has been operating with no shutdowns caused by mechanical difficulties, and with no appreciable wear on the original roll bars and plates.

This record of continuous high tonnage production is not just a claim — it's a *fact!* Better yet, is the fact that paper quality showed a remarkable improvement. *And this was accomplished with 35% less power consumption than would be required by any other refining method in the world on equivalent papers.*

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N.Y., has been with Southern Paperboard since June 1947. He was advanced from mill superintendent to plant manager in 1949. From 1936 to 1946 he was associated with Union Bag & Paper Corp. Mr. Adams, who was advanced from assistant manager to general superintendent, is a native of Birmingham, Ala. He is a graduate of the University of Florida.

Paper Corp. of America Opens Michigan Groundwood Mill

The mill of Paper Corp. of America at Cheboygan, Mich., which recently converted to the manufacture of newsprint, has opened its own groundwood mill, according to I. Lawrence Lesavoy, chairman of the board. Extensive additions to the plant capacity have been under construction for the past six months, including a semi-chemical pulp mill. On completion of the program, the capacity of the plant is to be 120 daily tons of newsprint.

Mr. Lesavoy has announced that production will go principally to publishers in Michigan and neighboring states. According to the announcement, the newsprint produced has been greatly improved by a research program conducted with the cooperation of the Forest Products Laboratory in Madison, Wis. Mr. Lesavoy is in active charge of the expansion project.

Pulp, Paper Ranks 8th in DPA Tax Aid

Of all certificates of necessity approved by DPA through February 25, 1952, 93.5 per cent of the dollar value went into 15 major industrial expansion programs. The pulp and paper industry stood eighth in percentage of the total dollar value, which was $14,579,094,000. The industry was granted 97 certificates for $602,932,000 in proposed investments, which was 4.1 per cent of the total.

Ranking ahead of pulp and paper and accounting for 75.8 per cent of the dollar value total were the following industries: iron and steel; railroads, other transportation and storage; chemicals and allied products; public utilities; crude petroleum and natural gas extraction, petroleum refining and natural gasoline; aluminum and other nonferrous metals, and aircraft and parts.

GENERAL VIEW of Mando's recently modernized No. 2 Insulite machine at International Falls, Minn.

Mando Completes Insulite Div. Modernization

Modernization of No. 2 board machine at the Insulite Division in International Falls, Minn., has boosted the daily output of Minnesota & Ontario Paper Co. to 1,275,000 square feet. Work on No. 2—completed in a record two months—increased total output of Mando's machines by 25,000 square feet.

The block-long machine, shut down since December 17, is now one of the most modern at the Insulite plant, which contains four units. According to J. H. Davidson, chief engineer, all four are now running at peak capacity and efficiency.

The recent project marks the first extensive remodeling and building job performed on No. 2 since its installation in 1928. No. 3, built in 1930, was modernized two years ago. No. 4 was put into production in 1945. The oldest of the four, No. 1 was constructed in 1914, when Mando pioneered the insulation board industry in the United States. Since that time, it has been modernized several times and today ranks as a modern and efficient unit.

300,000 Square Feet Daily

Remodeled and modernized at considerable cost, No. 2 machine produces more than 300,000 square feet a day. Increased output and greater efficiency were accomplished by completely rebuilding the 360-foot drying kiln, addition of a 30-inch suction roll, and replacement of the headbox, along with other major changes.

Removal of water from the Insulite sheet has been increased with the addition of a third air circulation system. Prior to the remodeling of No. 2, it was equipped with a two-zone circulation system. To increase this system to three zones, Mando's maintenance crews dismantled and rebuilt the kiln. New doors, new ducts, and extra heaters were added. In addition to the new circulation system, more rolls were built in, leaving a smaller space between the rolls and making it possible to run the thinnest board made. Approximately a mile of heating pipes were added to the drying unit, and about a third of the present coils were replaced.

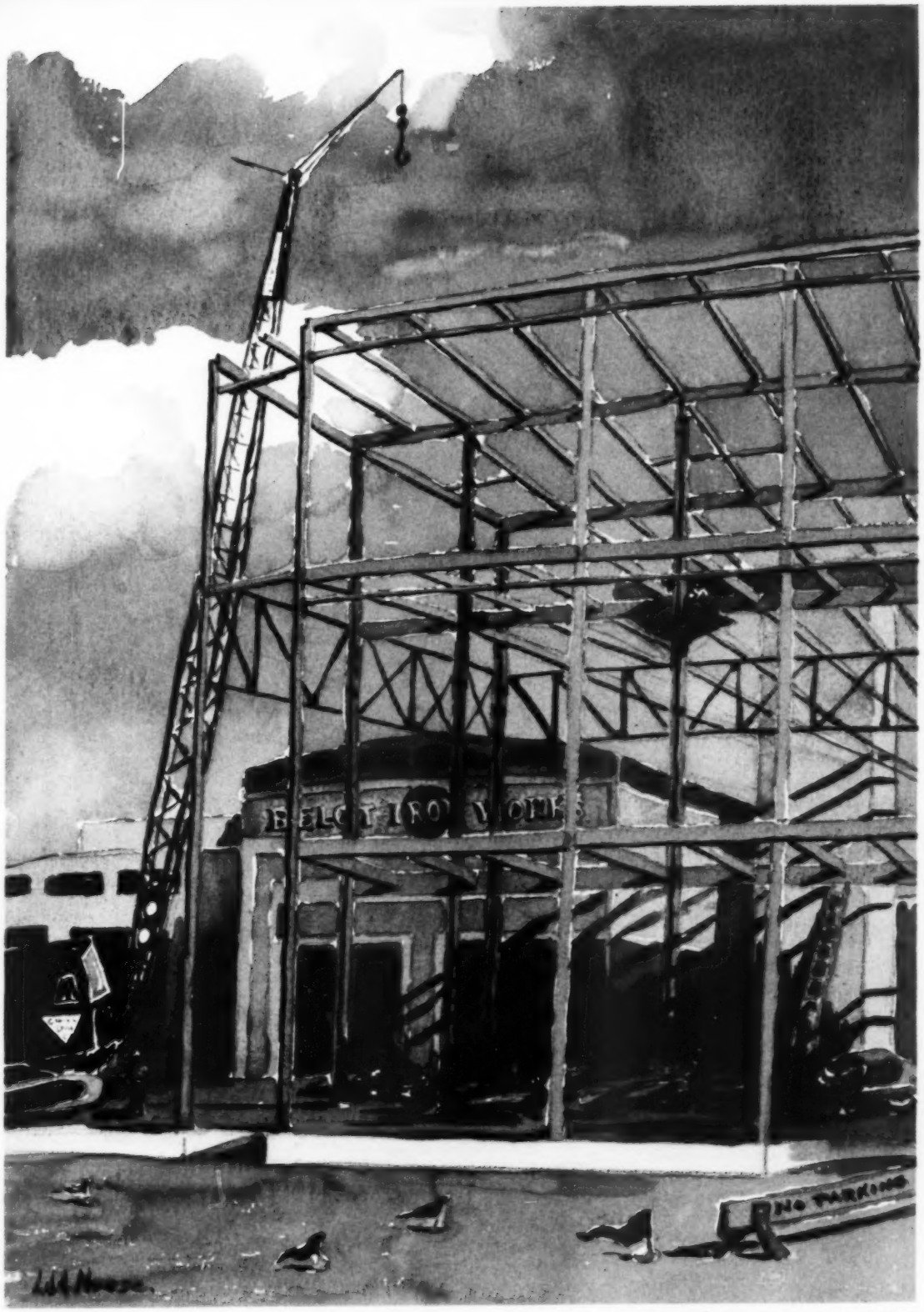
Water removal has been aided by another innovation: heating coils have been placed in the recirculation ducts so that the air is now pre-heated. This improvement gives No. 2 additional heat in its drying section.

Wet End Improvements

To get more water out of the board before it reaches the drying kiln, a new 30-inch suction roll has replaced a solid press roll. Other improvements in the wet end include complete overhaul of the head box. It was entirely rebuilt of steel and was fitted with Mando-designed agitation equipment for the first time. Such agitation of the thick pulp before it reaches the forming rolls gives the Insulite produced by No. 2 greater uniformity. The machine chest circulation system was also rebuilt, and the base plates on the forming chest were reset.

Wet end changes, according to Mr. Davidson, give Mando Insulite craftsmen greater and more flexible control over the caliper of the board than was previously possible. Such wet end improvements and modernizations allow workmen to change the machine's caliper more quickly and with greater ease. Further control of thickness is possible with the addition of three new calipers for recording the thickness of the board as it comes off the forming cylinder. Other modern inovations include the electrical control of the cut-off and feed section. New trim saws and a new tipple were also installed.

Mr. Davidson reported that the proj-



WATER COLOR PAINTING BY L. J. A. NEESE

PLANT EXPANSION at Beloit Iron Works, Beloit, Wisconsin, will permit reorganization for increased efficiency in building high-speed, high-production Beloit paper machines.

ect was under the direction of the plant engineering force assisted by erectors from Downingtown Mfg. Co., Downingtown, Pa., and Coe Mfg. Co. of Painesville, Ohio. Mando's 75-man maintenance crew installed the new machinery in a record-breaking 62 days. Downingtown supplied machinery for the wet end, and Coe was responsible for the equipment installed in the drying kiln.

Ketchikan Mill Construction to Begin This Year

Construction is to begin this year on a $40,000,000 pulp mill at Ketchikan, Alaska, it was reported in April by L. P. Turcotte, president of Puget Sound Pulp & Timber Co., Bellingham, Wash. Plans for the project were first revealed three years ago.

The mill, to be operated by Ketchikan Pulp Co., will be jointly financed by Puget Sound Pulp & Timber and American Viscose Corp., New York, N.Y. Mr. Turcotte said that a stand of 8 billion feet of virgin timber that is to be made available to the company by the United States Forest Service will be sufficient to supply the mill indefinitely.

Scott Announces Two Projects

Construction of a new roof for the paper mill and installation of additional pulp equipment have been completed recently at the Oconto Falls, Wis., plant of Scott Paper Co.

To accommodate the greater height of No. 1 paper machine after rebuilding and to make it possible to install a traveling crane over both machines, the roof in the paper mill had to be raised some 15 feet. The job was completed without having to shut down either paper machine for more than three days.

New pulp equipment has also been installed at Oconto Falls to handle the increased requirements of the rebuilt No. 1 machine. A new 1000 lb. capacity Pulpmaster, manufactured by E. D. Jones & Sons Co., is capable of breaking up entire skidloads of pulp when dumped as a unit in the churning mechanism.

At Everett, Wash., Scott is planning the construction of an office building to house engineering and other personnel who are to supervise construction of a proposed paper mill.

West Virginia Pulp & Paper Opens New Woodyard

Operations have begun at a new streamlined woodyard operated by West Virginia Pulp & Paper Co. at Alma, Ga. The installation, which gives Bacon County its first home market for pulpwood, is managed for the company by H. L. Chancey.

The yard occupies an area of approximately two acres. Facilities include a scaling house for measuring truckloads of pulpwood, a crawler crane for unloading trucks and loading railroad cars, adequate space for wood storage, and an office for operating personnel. The new operation results from modern and efficient wood-handling methods developed by the company after several years of experimentation.

NEW RESEARCH and development laboratory planned in Chillicothe, Ohio, by Mead Corp.

Mead Corp. to Construct Million-Dollar Laboratory

Construction of a $1,000,000 research and development laboratory was to be started soon in Chillicothe, Ohio, by Mead Corp., according to a recent announcement by H. E. Whitaker, executive vice president. The two-building project will house offices, laboratories, and a pilot plant area for the research and development staffs.

The new buildings will provide larger, better equipped, and more flexible laboratory and office space. Laboratories will be piped for vacuum, steam, hot, cold, and distilled water, and gas and will be wired for electricity at 550, 220, 110 volts ac and 230 volts dc. All laboratory air will be exhausted outside and fresh conditioned air continuously supplied.

The main buildings is to be two stories in height, 166 feet long and 54 feet in width. Connected to it by a passageway will be the pilot plant building, a single story, high roof structure 150 feet long and 102 feet wide. The pilot plant encloses 15,630 square feet of space, the main building 8,980 on each floor.

National Container to Begin Georgia Construction Soon

Allocation of critical materials needed in the construction of National Container Corp.'s $25,000,000 pulp and paper mill near Valdosta, Ga., has been approved by the government. According to W. T. Webster, vice president and general manager, actual construction is to begin soon.

The mill capacity is to be 500 tons per day, but construction is to be such that doubling capacity will be possible. The installation will be 1,800 feet in length and about 800 feet in depth, considering the wood and storage warehouses. January 1954 has been set as the completion date for the mill, the largest in the National Container chain. Between 500 and 600 will be employed.

Expansion Notes

Robert Gair Co., Inc.,
New York, N.Y., has announced the acquisition of the American Coating Mills Division of Owens-Illinois Glass Co. American Coating, with offices at Chicago, has factories at Chicago, Elkhart, Ind., Grand Rapids, Mich., and Middletown, Ohio. Net sales of the division in 1951 exceeded $20,000,000. It is to be operated as American Coating Mills Corp., a wholly owned subsidiary.

St. Regis Kraft Corp.,
Jacksonville, Fla., has applied for a permit to construct a water intake channel in the Broward River for its new paper plant at East Port. The intake would consist of two parallel sheet steel walls, spaced about 30 feet apart, leading from the pump house for a distance of about 470 feet into the waterway. The tops of the walls would be about a foot above mean high water.

Rayonier Inc.
has purchased a block of 127,500,000 board feet of fire-killed national forest timber near Forks, Wash., on the Olmpic Peninsula. According to Len J. Forrest, land department manager, $1,233,925 was involved in the transaction. Salvage of the timber is to begin immediately.

Crown Zellerbach Corp.
was to dedicate its new laboratory in Camas, Wash., May 1. Dr. W. W. Moyer, director of research, is to be in charge.

Scott Paper Co.
has been allowed federal tax benefits in the construction of a $20,800,000 plant

in Everett, Wash. DPA has announced that the Everett plant will be entitled to write off in five years, as depreciation for tax purposes, 40 per cent of the project's cost.

Bowaters Southern Paper Corp. has authorized its consulting engineers, J. E. Sirrine Co. of Greenville, S.C., to invite and accept proposals for the equipment and construction of an integrated newsprint plant at Charleston, Tenn. The firm recently obtained from NPA a certificate of necessity for the plant.

Dixie Cup Co. has announced the start of operations at its 100,000-square foot plant at Anaheim, Cal. The $1,000,000 facility brings to six the number of Dixie plants now in operation for the production of paper cups and containers. Capacity at the home factory in Easton, Pa., is being increased by the addition of space and equipment. Production capacity has also been increased by sizable additions to both the Fort Smith, Ark., and the Brampton, Ont., plants. The firm has spent more than $13,000,000 in expansion and modernization since the close of World War II.

Shultz Folding Box Co. was expected to have its new Pacific, Mo., plant in operation in April. The plant covers about 2½ acres.

Cupples-Hesse Corp., St. Louis paper products manufacturing firm, has purchased Smith Envelopes, Inc., of Detroit. The Detroit operation will be known as the Great Lakes Division.

Wisconsin Outlines Four Research Fields as . . .

Nationwide Efforts to Reduce Stream Pollution Continue

Active investigations by the Wisconsin pulp and paper industry covering 15 major fields of scientific study designed to reduce sulphite pollution have now been divided into four principal research fields, according to a recent announcement from the Sulphite Pulp Manufacturers' Research League, Appleton.

Whole liquor research includes roadbinder, evaporation and burning, briquetting and assorted other possibilities for utilizing all the collectible spent liquor instead of flowing it into streams.

Sugar research includes making torula yeast, together with other fermentation processes for consuming the wood sugars from the liquor. Sugars are the most active element of the liquor in using up dissolved oxygen, and if they can be got rid of by preliminary treatment before disposing of the rest of the liquor, a substantial improvement is likely to result in the stream.

Lignin research has two branches. One of these deals with making useful chemicals from this dissolved material in the liquor, and the other deals with trying to make lignin insoluble. Several medical products derived from sulphite liquor lignin are being successfully used in treating diseases. Lignin can be made into good adhesives, but if the researchers can change the material so that these adhesives will resist water, much wider markets would be opened. Lignin does not create serious problems when it goes into streams, but scientists are looking for ways to use it up after the sugar is removed from the liquor.

Recovery of chemicals used in the pulping process is the scientists' fourth research field. These are relatively unimportant factors in sulphite pollution, but if chemists can take them out of the spent liquor for reuse, the water flowing out of the mill will be just that much closer to the condition in which it was first pumped from the river.

Asphalt Firms Interested in Sulphite Research

Asphalt companies have recently displayed interest in a research project being sponsored by Wisconsin sulphite mills at the Natural Resources Research Institute of the University of Wyoming. This is a part of a large research program undertaken by the mills in their efforts to reduce stream pollution. A substantial grant was made to the Wyoming school by the Sulphite Pulp Manufacturers' Research League for the purpose of studying the use of spent liquor in conjunction with asphalt products such as are used for road construction.

A group of Wisconsin pulp and paper industry research scientists is now at Laramie working out the detailed arrangements for permitting one of the major oil companies to cooperate in this project. Leading the Wisconsin delegation are Clyde Faulkender, technical director of Hoberg Paper Mills, Green Bay, and Averill J. Wiley, technical director of the Research League at Appleton.

Black-top asphalt roads are made with a by-product of the petroleum industry. Sulphite roadbinder from a pulp and paper industry by-product has proved its value on Wisconsin unpaved roads in recent years, and this use has substantially reduced sulphite pollution of Wisconsin streams. Preliminary tests indicate that carefully controlled use of sulphite liquor along with asphalt may produce better roads than either material by itself. All additional uses for sulphite liquor are being sought by Wisconsin pulp and paper mills in order to keep from flowing this material into the streams.

Accompanying Mr. Wiley and Mr. Faulkender is Bernard Van Camp, League research chemist. The Wyoming institution is already studying the use of Wisconsin mills' sulphite liquor in coal briquetting. Mr. Van Camp will work with Wyoming engineers on a pilot run to determine the effects of different variables on the production of high quality briquettes.

Michigan Commission Warns Kalamazoo Mills

Officials of Allied Paper Mills, Kalamazoo, Mich., have been warned by the Michigan Water Resource Commission that the state still expects completion of the Monarch mill's waste water treatment unit by October 1, 1953. The action by the WRC, it was reported at Lansing, was taken after it was noted that the March 1 deadline for Allied to submit engineering plans for controlling pollution of the waters flowing into the Kalamazoo River had passed without compliance so far as the Monarch mill is concerned.

With the exception of Allied's Monarch and King mills, paper mills of the Kalamazoo Valley face a joint time limit of June 1, 1954, for compliance with the Commission's pollution abatement orders. The deadline for plans is April 1, 1953. The King mill's compliance deadline is September 1, 1955.

NCSI South Central Committee Expanded

At a recent joint meeting of the operating committee and regional chairmen of the National Council for Stream Improvement, Inc., it was agreed that broader representation of the industry in semi-chemical pulping wastes is desirable. Since these processes are now being employed outside of the South Central Region, where they were originally developed and applied, it was suggested that the committee in this region be supplemented by representatives from other parts of the country. The committee has been active in directing semi-chemical waste research.

In accordance with this proposal, Dr. Donald T. Jackson, research director for Hammermill Paper Co., was appointed

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MR. T.I.

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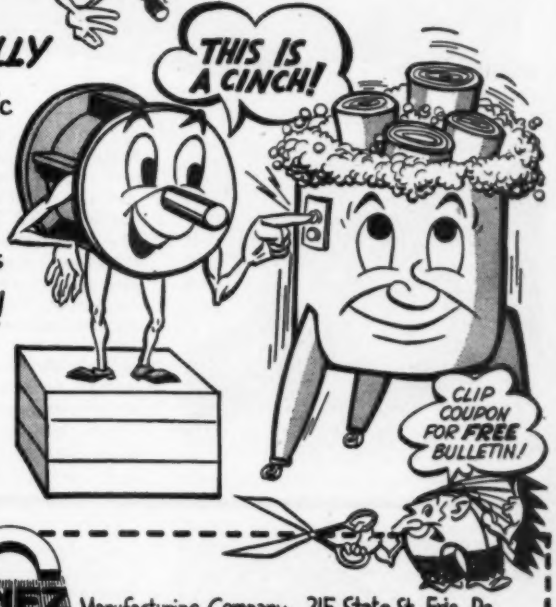

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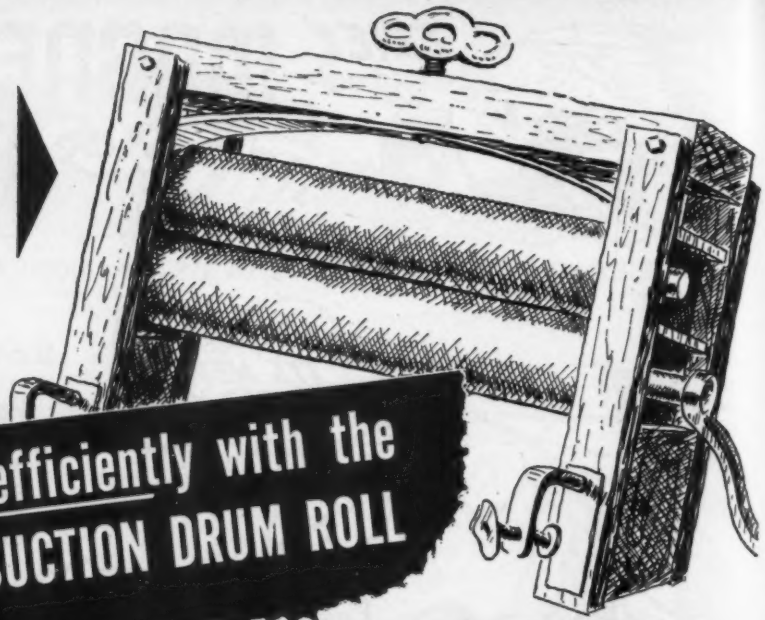

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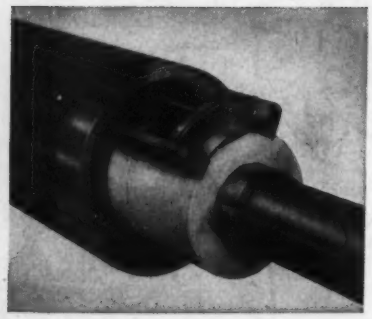

Balanced design at its best. Note these features: Box and shell built concentrically; box can be pulled in running position; smooth, even contact of packing against inner shell bore; pressure of packing against inner shell bore *always* at right angles to centerline of box and shell; durable stainless featherweight packing springs, stainless steel studs and nuts.

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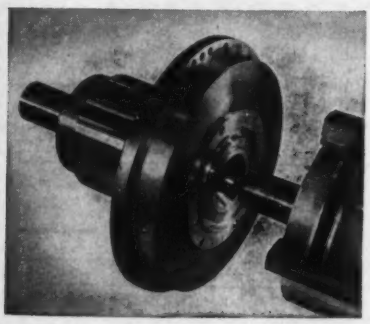
5. Cleaner Felts
6. Faster Drying Rate
7. Increased Production



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chairman of a new and inclusive committee to cover this phase of the Council's program. Dr. Jackson met with other members of the operating committee and the chairmen of the south and south central technical subcommittees regarding representation on the new group.

President's Group Suggests National Stream Legislation

Morris Cooke, chairman of the President's Water Resources Policy Commission, has released copies of the proposed Water Resources Act. The Commission's drafted legislation would establish the policy of recommendation of river basins as units of development, define broad national objectives in the safeguarding of essential resources, and affirm the duty of the federal government to bring about maximum utilization of water and lake resources.

The provisions of the act would establish up to 15 river basin commissions to coordinate the water and land resources development work of existing federal agencies and provide for state and local participation through advisory committees. In this connection, it is reported that the President has asked the Budget Bureau to draw up a substitute bill. It is expected that the Bureau will present its recommendations in a few weeks.

Synthetic Gravel
is a possible by-product of spent sulphite liquor, according to two Cornell University professors. The process calls for fusing a mixture of mud, inexpensive chemicals, and the sulphite liquor.

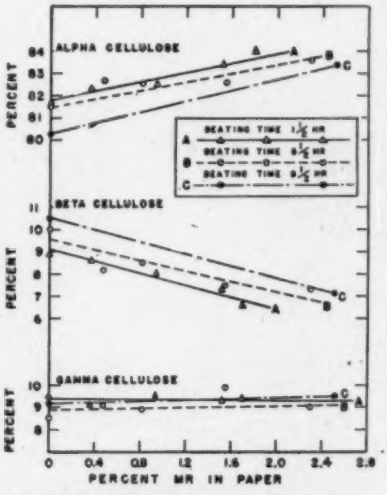
Bureau of Standards Study Shows Effect of Melamine Resin on Paper

With the increasing use of melamine resin in paper and paper products has come the need for data on the effects on the presence of the resin on chemical tests applied to paper in order that the results of such tests may be correctly interpreted. Accordingly, a study of some of the widely used chemical tests of paper has been undertaken by the National Bureau of Standards in Washington, D.C. Results of the study were recently made public.

Participating in the research for the Bureau were William K. Wilson, Jack L. Harvey, and Alice A. Padgett. The work included the determinations of alpha-cellulose, copper number, rosin content, pH, and cuprammonium disperse viscosity.

It was found that the addition of melamine resin in the manufacture of paper usually increases the analytical alpha-cellulose value of the paper. The determination of rosin, which includes both natural resins and any rosin soaps

APPARATUS USED by the National Bureau of Standards to determine the effect of melamine resin on the viscosity of solutions of paper in cuprammonium hydroxide



GRAPHIC REPRESENTATION of the effect of melamine resin (MR) in paper on the alpha, beta and gamma cellulose values; data are shown for several lithographic offset papers containing 75 per cent bleached sulphate and 25 per cent bleached soda and beaten 1½, 5½, and 9½ hours

added to impart resistance to water penetration, is unaffected by the presence of melamine resin in a paper. The copper number, on the other hand, is reduced by melamine resin; this represents an improvement, since high copper numbers are indicative of low-quality cellulose.

The NBS investigation also revealed that melamine resin undergoes an alkaline hydrolysis in hot water-solution. Papermaker's alum (aluminum sulphate) is known to undergo an acid hydrolysis in hot water-solution. Since the pH of paper is often measured on the hot water extract of the paper, it is apparent that this value will depend on the relative amounts of alum and melamine resin present.

The cuprammonium disperse viscosity of cellulose is related to the length of the cellulose chains (molecules), and this is in turn related to the quality of the cellulose. Measurement of viscosity of papers is made on a solution of the paper in a suitable solvent, in this case cuprammonium hydroxide. In measuring the cuprammonium viscosity of papers with and without melamine resin, it was found that the resin renders high quality papers only partially soluble in the reagent at 0.5 per cent concentration. For this reason viscosity measurements lose their meaning.

In addition to the chemical tests mentioned, the effect of melamine resin on the heat stability test, used to compare the relative stabilities of papers to natural aging, was examined. Results indicated that melamine resin tends to stabilize papers, as measured by the changes taking place in alpha-cellulose and copper number on accelerated aging.

In summary, the presence of melamine resin in a paper, in addition to imparting special properties, appears to produce a slight improvement in the quality of the cellulose and in the stability of the paper. Whether such improvements are related to the true permanence of a paper—its resistance to natural aging—is yet to be determined.

Paper Snow Fence Tested in Michigan

Reinforced paper for snow fencing has been tested by the Michigan State Highway Department. According to Burleigh R. Downey, chief of the department's maintenance division, the paper fencing is far more practical than the conventional wooden type, which has to be taken down and stored every spring. The paper fence may be burned. The new development has been tried out on six miles of state highway. It consists of paper reinforced by fiber and fastened to metal posts.

Hardwoods Open Vast New Frontier in Maine

The increasing use of hardwoods as a raw material in the paper industry has opened New England's "last frontier." It's the vast hardwood timber area in Maine, stretching from 42-mile-long Moosehead Lake to the Canadian border. According to the state forestry department, few white men have seen parts of these millions of acres. Even the department isn't quite certain how much hardwood covers the area.

This green empire is being opened to operations because the paper industry, which considered hardwoods a liability 20 years ago, is using more and more of them every month. The softwoods, at least in New England, are passing as the industry's chief raw material. The prin-

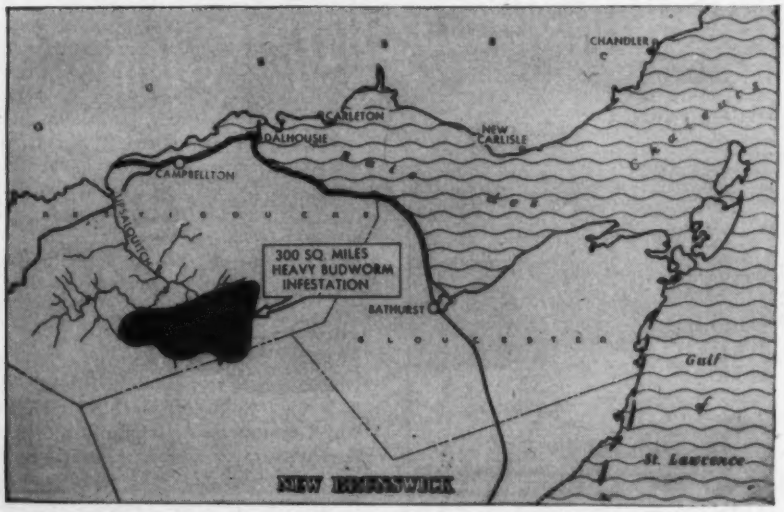
cipal hardwoods found in Maine are birch, maple, and oak. The leading soft woods are spruce, pine, and hemlock.

Owner of a great share of the area is Great Northern Paper Co., largest newsprint producer in the United States. The firm's timberland holdings cover about 12 per cent of the state's 32,480 square miles. Great Northern, which bought up entire townships in the state 50 years ago, has developed its own road system.

The silent revolution in the industry whereby hardwoods are being used in the manufacture of paper had its beginning some 20 years ago. It still goes on. Companies that once charged off their hardwoods as worthless now have "hidden assets" on their balance sheets. Brown Co. built a mill at Berlin, N.H., during the war to utilize the hardwoods it left behind when the softwoods were cut years ago. S. D. Warren Co., near Portland, Maine, used its last softwood June 20, 1951. Today the firm is 100 per cent on hardwoods.

New problems were created with the shift to hardwoods. They can't be floated down rivers, as can the other species, but must be trucked or carried by rail. However, they are cheaper now and comprise 40 per cent of the present 17,000,000 timberland acres in Maine.

Great Northern, a newsprint producer, is exporing possible methods of capitalizing on its hardwood holdings. Late in 1951 it elected a new president, Manuel C. McDonald, an authority on hardwoods. The firm says it will always manufacture newsprint, but it wants a market for its hardwood empire too.



FORESTED AREA in northern New Brunswick being attacked by the spruce budworm; gigantic spraying operations were to be undertaken in the region during May

New Brunswick Spraying Operations Planned as . . .

Canadian Forestry and Paper Industry Operations Reflect High Production

In the heavily forested area of northern New Brunswick preparations were being rushed in April for the launching this month of the biggest project of its kind ever undertaken in Canada—the aerial spraying of 300 square miles of spruce and balsam fir forest threatened with extinction by the ravaging budworm. The region, owned by the provincial government as Crown Lands and leased to New Brunswick International Paper Co., is estimated to contain 2,000,000 cords of pulpwood valued at approximately $8,000,000 in stumpage revenue to the province. The acreage involved normally feeds the NBIP pulp mill at Dalhousie.

The joint project is being carried out by New Brunswick International Paper, Canadian International Paper Co., and the New Brunswick government with assistance from the federal government.

Near the center of the ravaged area an airfield of 60 acres with two landing strips has been hewn out of the forest wilderness. Approximately 25 aircraft are to be employed in the short but extensive spraying project. The budworm attack is usually at its height in May, and therefore forest entomologists believe that that is the best time to carry out the $500,000 spraying program.

During the winter insecticides, aviation gasoline and other needed supplies were trucked 60 miles to the airfield over frozen woods roads and stockpiled for the spring campaign. Bush pilots were to be hired to carry out the spraying at tree-top height during the early mornings before the winds rise. Some 200,000 gallons of formulated DDT was to be used, while approximately 30,000 gallons of high octane gasoline would be consumed in the operation.

Major aerial contractor for the job is Central Aircraft, Inc., a Yakima, Wash., crop-dusting firm with long experience in forest spraying. Central will furnish 17 of the aircraft—Stearman biplanes. These and two Canadian aircraft from Vancouver, B.C., are to be ferried the 3,600 miles from Yakima to New Brunswick.

For each acre one pound of DDT will be dissolved in a gallon of oil. Some 20 acres will be sprayed per minute.

Last Assault in 1920s

In the 1920s the last attack by the budworm wiped out an estimated 22,000,000 cords of pulpwood in the province. At current market prices the timber destroyed would have been worth a half a billion dollars. The current infestation began in 1948. The insect has been well known in New Brunswick, where it has been traced as far back as 1770.

During the last three years entomologists have followed closely the spread of the pest, and they believe that it will reach its murderous peak this spring in a 250-square mile area on the headwaters of the Southeast Upsalquitch River in Restigouche County. Elsewhere in a 2,200-square-mile infested area the epidemic has not yet attained the same serious stage. Experts feel that only on the Upsalquitch River will spraying from the air with DDT have a chance of success.

While this project was to be the biggest ever attempted in Canada, large scale campaigns have been conducted in the United States, and in Oregon particularly. On the basis of that experience, it has been found that the spraying should be limited to the three- or four-week feeding period of the worm, when it is attaining its maximum size as a larva and is most vulnerable.

Experts Assigned to Project

Assigned to the project for the province of New Brunswick are W. W. MacCormack, chief scaler, and K. B. Brown, director of the Department of Lands and Mines photogrammetry division. The federal team of experts is headed by R. E. Balch, director of the federal entomological branch at Fredricton. Assisting him will be K. R. Elliott of the science service and Frank Webb of the entomological laboratory.

B. W. Flieger, forest education director for New Brunswick International Paper, organized and was to direct the project. L. S. Webb, chief forester for

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STRIKING SAVINGS are created in pulpwood handling by the Speed-o-Matic controls of this K-360. Lost motion is eliminated. Up to 25% more work is done per day. Speed-o-Matic is a *power-driven* hydraulic system—no air or vacuum actuated devices. Hence no lag, no jump, no jerk.

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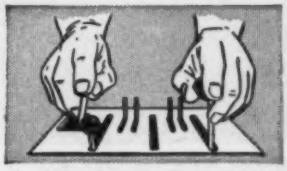

Speed-o-Matic Controls — fully hydraulic! You "feel" the load all the way. Simple, easy—fingers instead of muscles do work.

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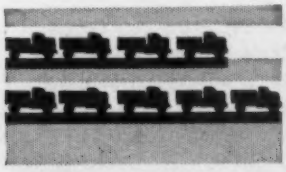
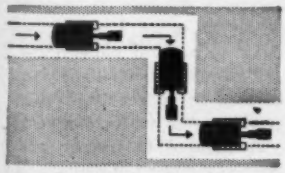
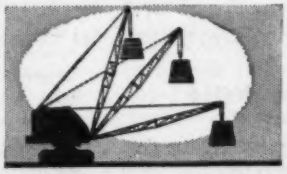


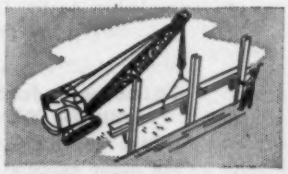
Up to 25% more production — fast operating cycle steps up output and profits. Effortless control keeps operator fatigue down.



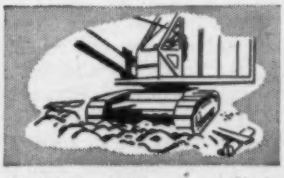
Turns on a Dime. Either track can drive or be locked independently. Hydraulic control gives instant response.



Independent Boom Hoist — controlled power *down* as well as up. *Safer,* faster. Boom, hoist, swing simultaneously or independently.



Pinpoint Accuracy — eliminates lost motion. Instant hydraulic response assures spotting heaviest loads—easily, precisely.



High Ground Clearance — eliminates snagging or fouling in rough areas. No projecting castings or easily damaged parts.

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Builders of the most complete line of shovels, cranes and draglines

CEDAR RAPIDS, IOWA

BUDWORM AT WORK; shown in its larva stage, the insect is stripping the needles from a spruce tree

DAMAGE WROUGHT by the spruce budworm; the tip of an otherwise healthy tree is almost completely stripped of its foliage

the firm, is serving as a consultant as a result of his past experience with budworm forays.

Larva to Worm

From the larva the insect pupates and emerges as a full-grown moth in August and will lay up to 250 eggs on the tree branches. These hatch into tiny worms and lie dormant and protected under the needles until spring, when they emerge to begin eating the needles and eventually strip the tree. Each year the process continues with the attacked trees becoming stripped of their new foliage as well as older growth. Gradually the tree dies, rots, and is felled by winds to become a forest fire hazard. Experience has shown that budworm stripping renders a forested area unproductive for as long as 50 years.

The area now being attacked in New Brunswick contains enough wood to supply the Dalhousie mill for seven years—worth upwards of $100 million in wages and other income to the people.

Reversing a Trend, Canadian Mill Gets U. S.-Grown Wood

Reversing an international trade trend of the last 25 years, a Canadian paper mill is relying increasingly on American-grown wood. Though Canada is acknowledged to be one of the world's most important sources of forest products, Howard Smith Paper Mills Ltd. of Cornwall, Ont., finds it profitable to acquire wood in the United States.

Two principal circumstances have combined to create this situation. First, Howard Smith has adopted hardwood as an ingredient in papermaking. Second, the farm woodlots around Massena and Fort Covington, N. Y., are excellent producers of a number of hardwood varieties. As for pulp stock, there is no large demand for the hardwoods in the United States, where spruce is the major item sought by mills. Spruce, of course, is exported in large volume from Canada to the American manufacturers.

Howard Smith officials believe that utilization of hardwood for paper is in a promising infancy. C. A. Benjafield, the firm's wood buyer, has declared that the development has limitless possibilities for area woodlot owners. Stressing the long-term value of the hardwood pulp market, he said that "the company has spent money, time and effort to find out how to make paper from hardwood. We're going to want a lot of wood for a long, long time. I'd like to impress woodlot owners with the permanence of the business."

Company executives are looking in particular to St. Lawrence and Franklin counties in northern New York as having a vast potential for hardwood pulpwood. The volume coming across the border to the Cornwall mill is already large, and promises to increase.

Canadian Industry Riding "Prosperity Wave"

Canada's billion-dollar-a-year pulp and paper industry is riding the "crest of a prosperity wave" that experts say may falter but will never break. A recent survey has shown that the industry that ranks as Canada's biggest and one of the world's major industrial enterprises has more orders than it can fill. It plans expansion within the next 10 years greater than its entire facilities prior to World War I.

R. M. Fowler, president of the Canadian Pulp & Paper Association, has declared that it is not unreasonable to expect a new total capital investment in pulp and paper facilities of more than $600,000,000 by 1955. Dollarwise, that is 70 per cent greater than the growth in the years 1946-50.

Most plants are being modernized for the accelerated production of almost everything that can come from woodpulp, particularly newsprint, of which Canada is the world's leading exporter. Industry officials say that it is practically impossible to estimate the additional capacity with any accuracy other than from project figures supplied by the various companies.

Initial Elk Falls Output Expected in Summer

Initial daily newsprint production of 240 tons is expected early this summer from the $40,000,000 mill built by Elk Falls Co. at Duncan Bay, B. C. The mill—the only new newsprint facility built in Canada during the last 10 years—is fast nearing completion.

Vice President Paul E. Cooper in a detailed report has stated that building and structural work is almost entirely finished. Equipment installation is also well advanced. Completed are buildings that are to house the paper machine, screen, and grinders. A warehouse 480 feet long by 81 feet wide, which adjoins the machine room, is ready for use, as are repair shop installations.

A paper machine that will operate at about 2,000 feet per minute is nearing completion, and the first shipments of sulphite pulp have arrived. Steel is up for the mill's boiler house, and two boilers are being put in. They each have an hourly capacity of 85,000 pounds.

Pacific Mills Ltd., Canadian subsidiary of Crown Zellerbach Corp., and Canadian Western Lumber Co. are partners in the venture.

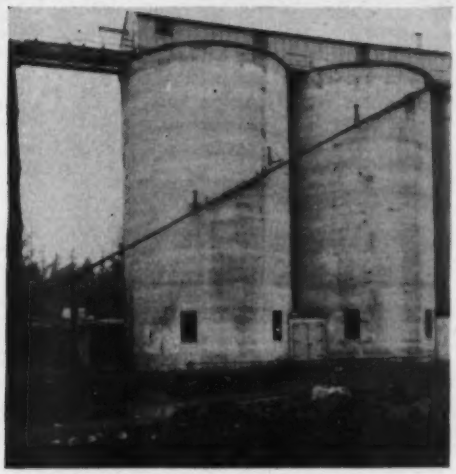
Only Three Provinces Without Paper Mills

In a recent address before the Engineering Institute of Canada, G. Hobart noted that only three of Canada's 10 provinces have no pulp or paper mills. There are 130 mills in the whole of Canada, which produce more value than the entire grain crop or the total mineral production, including gold, base metals, petroleum, coal, asbestos, limestone, and sand and gravel.

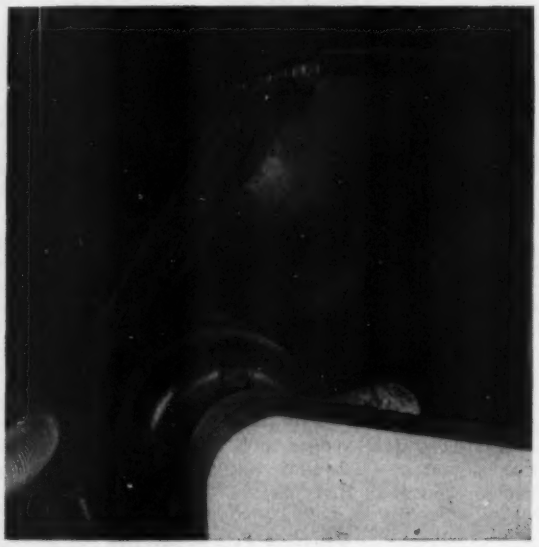
Each year the mills produce 9,000,000 tons of pulp and paper with a value of more than $1,000,000,000. Over the past six years the industry has increased output by 1,000,000 tons, and to keep up with the present demand it will have to increase by 2,000,000 tons by 1960.

Over-all volume of growth in Canada's forest is exceeding the annual consumption, including loss due to fire. The paper industry consumed only 19.4 per cent of the depletion of last year.

BLOWER UNITS all channel into the one pipe, coupled to the feeder that packs the airstream with chips



SMALL PIPING can be used since the airstream carries its maximum chip capacity, installation thus simplified



CHIPS FROM THE OUTSIDE conveyor feed into the hopper, from which the chips are metered into the airstream

STANDARD BLOWER UNITS, mounted in any required number, provide versatility and economy in spare parts

MacMillan & Bloedel Install New Blower and Chip Feeder at Nanaimo

MacMillan & Bloedel has announced the installation at its Harmac mill near Nanaimo, B. C., of a new type blower and chip feeder unit. Designed and developed by Conveyair Co. of North Vancouver, the system is the result of a demand for transporting pulp chips in a more economical manner by blower. The unit offers a number of improvements over existing systems, which are often not too well adapted to the movement of chips.

One of the most difficult problems encountered in the field in recent years has been in feeding enough chips into the air stream of the blowers so that the equipment is moving the maximum volume of chips that can be transported by a given air stream without wasting power blowing empty air through the tubing. This has been overcome by a special feeding apparatus that meters the chips into the airstream at a constant rate with the optimum concentration of chips to air.

At the Harmac Mill the chips are transported from the Youbou sawmill of B. C. Forest Products Ltd. in 10-unit trailers. The trailers are dumped into an outdoor bin by a hoisting device constructed over the bin. From here the chips go by a conventional conveyor to the hopper above the feeder of the pneumatic Conveyair system. The system must be able to deliver hemlock and fir chips to different silos as they are required separately in the pulping process. This is accomplished by selectors and valves.

The Conveyair equipment is in four parts: the blower units, the feeder, the tubing and discharge outlet, and the control system. The volume of chips to be transported is determined by the size of the feeder unit and its rate of feed. Depending on the size of this unit and the volume to be moved, the system will require a certain number of blower units that are all connected through the same feeder.

This has certain advantages in that a number of small units, standardized as components of any blower system, all require the same parts that are readily stocked and also cheaper to purchase under standardized mass production methods. No special construction is

necessary to facilitate the units, and they can be installed in any position where space is available. The smaller units are light in weight, making the installation easier.

Smaller Tubing Used

Because of the greater concentration of chips in the airstream of the tubing, smaller tubing can be used. This in turn permits lighter brackets to be used, and these can be readily attached to walls or ceilings inside or outside. The smaller tubing also means that less motor power is needed to put through the same volume of chips, and this gives a power saving as well as reduced motor cost. The smaller equipment generally means that installation costs are reduced.

Chip discharge may be to storage through a separator or directly to use. The dust problem is practically eliminated. Chips can be discharged to several places by use of a Conveyair three-way valve that may be either manually or air operated. As the blowers and feeders are push-button controlled, the entire system is automatic. Labor requirements are kept to a minimum.

The principal modifications in the system, however, work on the fact that for economic pneumatic conveying of chips there must be concentration of chips in the air stream. The difficulty in the past has been to achieve this concentration. The Conveyair feeder meters chips into the stream from the blowers at a constant rate, controlling the air-chips ratio.

The blower motor unit is mounted directly on a cast aluminum base. The blower is of the positive displacement type and comes equipped with its own oiling system.

The chips are forced into the air stream under pressure, but actual tests have proven that the feeder does no harm to the chips. The rate at which chips can be transported is largely determined by the size of the feeder.

A special building need seldom be constructed, as the hopper has been designed with a maximum height of 24 inches and can be accommodated in any standard structure.

System at Harmac

At the Harmac mill of MacMillan & Bloedel chips are conveyed from the outsde bin to the feeder hopper inside a small building. Four blower units are installed, each with a 25 hp motor. These blowers pass though the feeder, which is powered by a 30 hp motor. The chips are then transported 125 feet horizontally and 75 feet vertically through a 7¾-inch tube at the rate of 40 units per hour to the top of the silos.

As fir and hemlock chips are to be kept separately, a selector switch is installed near the blower, and the stream can be diverted as desired. They are thus blown directly to their storage without the use of cyclones and without creating dust. The installations do not interfere with any existing equipment. The tubes enter the silos through a hole in the gallery sill and are supported along the sides of the silos by protruding brackets.

Alberta Pulp Plant Authorized by Provincial Government

International Resources Ltd., a firm backed by two Seattle financiers, will build a pulp plant at a minimum cost of $5,000,000 near Red Deer, Alta. An agreement between the government of Alberta and the firm was reached recently and calls for construction to begin by July 1, 1953. The completion date has been announced as October 1, 1954.

A 2,000-square mile pulpwood reservation in western Alberta has been set aside for International Resources by the government. The mill will manufacture groundwood and chemical or semi-chemical pulp or both.

Products will be available for export until April 1, 1962, when the company must start and complete in 15 months mill extensions that will make no further export necessary. The concern will then process the pulp in Alberta into paper products. The company has received a 21-year pulpwood cutting permit, which is renewable if the tract still holds creditable pulpwood. The government must be paid at least $15,000 a year in timber taxes, $4,000 a year in ground rent, and a minimum annual royalty of $12,500.

St. Lawrence Corp. Project to be Completed by 1954

The $22,000,000 expansion and modernization program currently being carried out by St. Lawrence Corp. is scheduled for completion by 1954. The aim of the project is to increase the firm's earning power through the expansion of saleable capacity, through increasing operating efficiency, and through a more economic diversification of productive capacity. Instead of the present concentration on the export of raw pulp, the company will concentrate on more finished products.

This new St. Lawrence program was launched with the recent corporate reorganization, which incorporates the three operating subsidiaries with the parent company, forming one operating firm.

The proposed expansion and modernization program allots $15,292,000 to the Red Rock, Ont., paper mill for the stepping up of daily production of groundwood pulp from 64 to 235 tons, of unbleached sulphate pulp from 275 to 390 tons. In addition, equipment is to be installed for the production of semi-chemical pulp using hardwood with a daily capacity of 55 tons. The existing fourdrinier machine is to be reconverted to the manufacture of newsprint with a capacity of about 200 tons a day. A modern high-speed 240-inch wide container board machine, designed for 180,000 tons annual production, is to be installed. On completion of the present program, available pulp supply will permit the operation of this machine at about 500 tons daily capacity.

An estimated $6,949,000 allotment for the East Angus, Que., mill is to include modernization of the woodyard, modernization of the unbleached sulphate pulp mill, installation of a semi-chemical pulp mill to use hardwoods, and installation of facilities to utilize the entire pulp production of the mill.

$25 Million B. C. Pulp Mill Announced

Westminster Paper Co. has recently reported plans for a $25,000,000 pulp mill in the Prince George area of British Columbia's northern interior. The plant will employ 300 persons, with an additional 350 in woods operations. The daily capacity is to be 300 tons. Westminster heads a group of investors who will construct the mill.

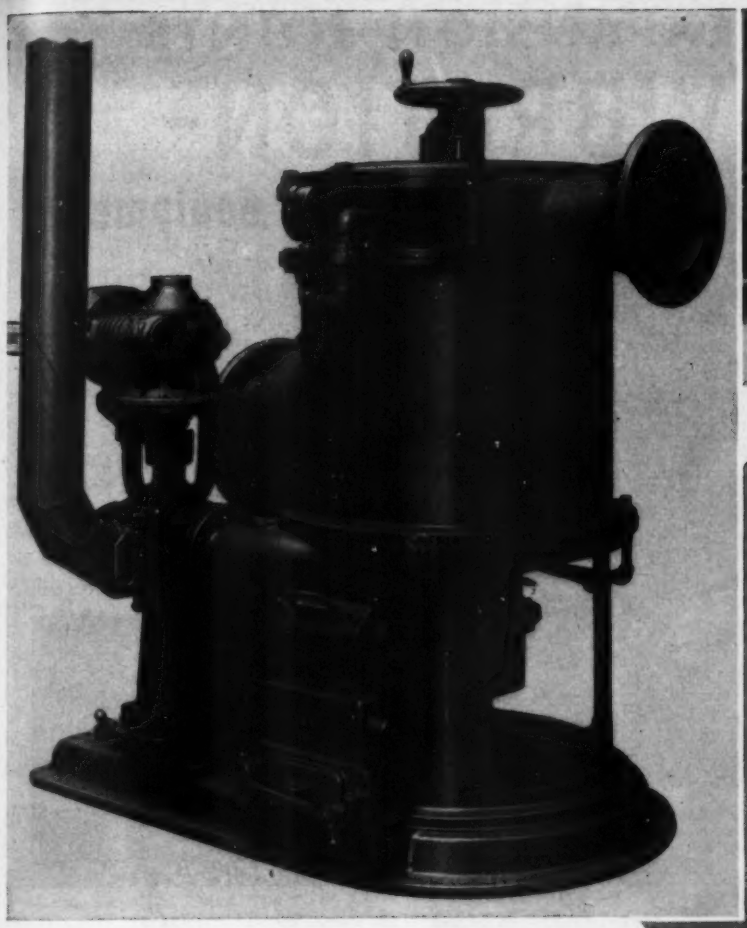
Westminster Paper Co. Ltd. may construct a $30,000,000 pulp mill at Prince George, B. C., it was reported recently at Vancouver. The firm has applied for a forest management license covering 500,000 acres in the Willow River district.

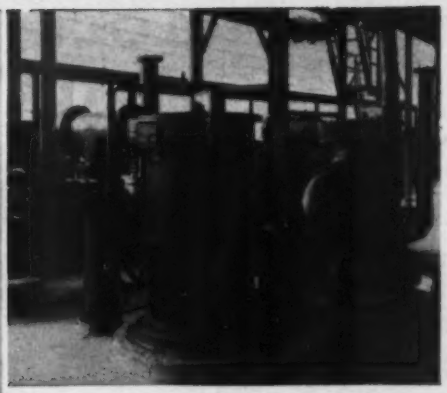
Canadian Pulp Production in the first two months of 1952 totaled 1,515,000 tons, as against 1,435,000 tons in the like period last year, according to the Canadian Pulp & Paper Association. All grades except unbleached kraft showed increase.

Kimberly-Clark Marks 80th Anniversary

Kimberly-Clark Corp., Neenah, Wis., is celebrating the 80th anniversary of its founding. The company magazine, *Co-operation,* marks the event by detailing the high spots in K-C's expansion since its Diamond Jubilee was celebrated in 1947.

Pictures accompanying the magazine story show the major events that have taken place during the last five years, including the expansion at Memphis, now a three-machine mill and awaiting the advent of the fourth machine this summer; LongLac Pulp & Paper Co.





flat screen replacement and better bundle breaker

Name the crudest equipment in your entire mill. The sloppiest. The most unsightly. The worst space wasters. Your flat screens, of course.

Sure we know that flat screens have been in use ever since Hector was a pup. You had no choice. It was that or nothing, and nothing wouldn't do.

But today is another day and there is another way. It is being offered to you in the Shartle Selectifier* Screen and at about the same price, screen for screen.

What's more, Selectifier Screens do a better job of fiber bundle breaking than any flat screen ever did.

They're small. They're compact. They're clean. They're quiet. They're being used ahead of Fourdrinier head boxes and on all vats—filler and liner.

Yesterday's way is not good enough today.

Contact Shartle for performance data on Selectifier Screens already in service. You'll be surprised.

SHARTLE BROS. MACHINE CO.

*Trade-mark

MIDDLETOWN, OHIO

DILTS MACHINE WORKS, Fulton, New York • *Divisions of* THE BLACK-CLAWSON CO., Hamilton, Ohio
Northern Sales Office: 814 N. Superior St., Appleton, Wisc. • *Southern Sales Office:* 937 Coventry Road, Decatur, Georgia
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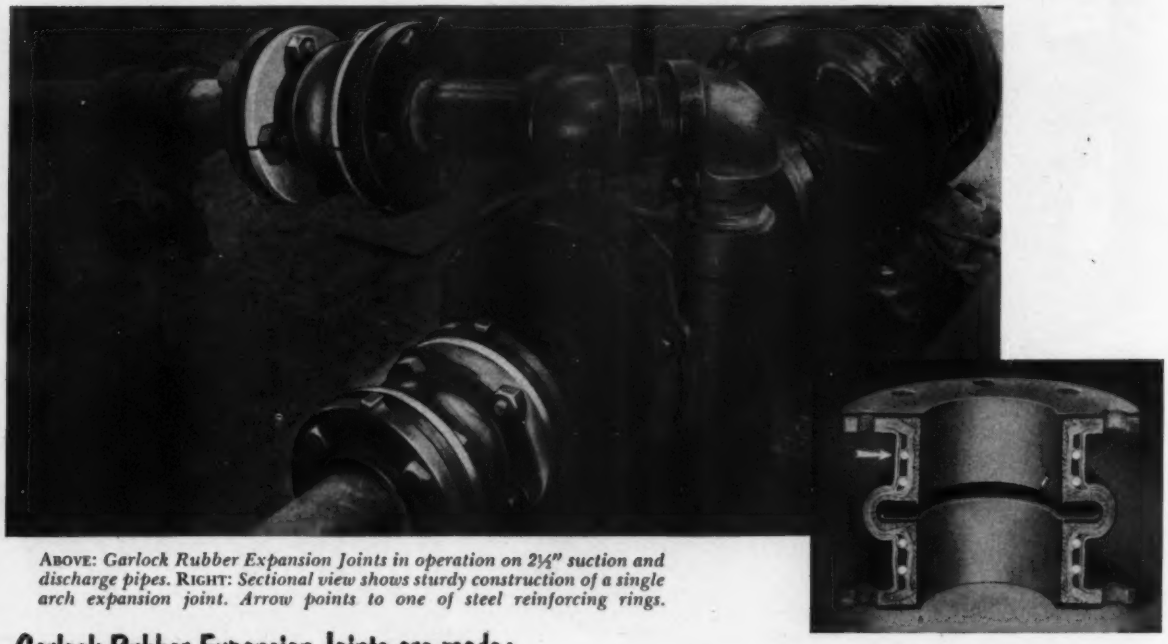
GARLOCK EXPANSION JOINTS

STOP VIBRATION-

relieve stresses and strains in piping and equipment



ABOVE: *Garlock Rubber Expansion Joints in operation on 2½" suction and discharge pipes.* RIGHT: *Sectional view shows sturdy construction of a single arch expansion joint. Arrow points to one of steel reinforcing rings.*

Garlock Rubber Expansion Joints are made:

- With single arch for normal expansion, contraction and vibration.
- With multiple arch for excessive pipe expansion.
- With filled arch for lines carrying sediment.
- Tapered for connecting pipes of different diameters.
- "U" type for vacuum to reduce vibration and noise on pipe lines conveying coal-laden air to pulverized coal burners and other types of light construction piping.
- With control units for excessive elongation of unanchored pipes.
- With neoprene lining for lines carrying water or air with some oil present.
- With neoprene lining and neoprene cover for lines carrying slight amount of oil and where exterior of joint is subject to oil drip or oil vapor.
- With neoprene throughout for lines carrying petroleum derivatives.
- In all pipe sizes from ¾" to 72".

Specify No. 204 for *Pressure*; No. 205 for *Vacuum*; and No. 206 for *Pressure* and *Vacuum*.

THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK
In Canada: The Garlock Packing Company of Canada Ltd., Toronto, Ont.

8 Big Advantages:

1. Made of high-grade rubber, they do not crack or fracture under repeated flexing.
2. They do not take a permanent set.
3. For pressures up to 125 p.s.i. (depending upon size of joint); and for vacuum of 30 in. of mercury.
4. Suitable for operating temperatures up to 180° F.
5. They do not corrode or erode.
6. They are light in weight and can be installed in a limited space.
7. They require no gaskets between the flanges of the joint and the flanges of the pipe.
8. They do not induce electrolysis.

GARLOCK

PACKINGS, GASKETS, OIL SEALS, MECHANICAL SEALS, RUBBER EXPANSION JOINTS

Ltd., Terrace Bay, Ont., which started production in 1948 and is now producing 60 more tons a day than it did at the start-up, and at Kimberly, Wis., where new materials handling equipment, a new clay handling program, and new stock systems have been added, and a paper machine is being rebuilt.

During the past five years the largest paper machine of its kind was installed at the Niagara mill, while a new creped wadding machine doubled the capacity at Kimberly-Clark of Canada Ltd., Kapuskasing. A new newsprint mill was constructed at Coosa Pines, Ala., and is being managed by K-C; a six-story warehouse and water treatment plant was built at the Neenah mill; a five-story warehouse was constructed at Niagara Falls, N.Y.; an Aviation Division was added to the traffic department; a sales promotion center was opened west of Neenah, and a new subsidiary was added with the purchase of controlling stock in the Munising Paper Co.

U. of Maine Foundation Semi-Annual Report

It was announced in the recent semi-annual report of the University of Maine Pulp and Paper Foundation that the membership now stands at 154. Included are one scholarship underwriter, 21 company members, 17 special gifts, and 115 individual members.

Explaining the activities of the foundation, the report states that "if the pulp and paper and allied industries expect to enjoy the fruit ripened on the tree of higher education, then they must supply the necessary impetus. Present day university budgets simply do not contain enough money to insure the worthwhile specialized training of qualified students. Certainly, most suppliers of machinery and chemicals are aware of the shortage of technically trained men."

Five principal fields of activity for the period covered by the report were listed: (1) the job of interesting students in careers in the pulp and paper and allied industries; (2) awarding nine scholarships to students and setting up a loan fund; (3) reviewing curriculum with staff members of the university; (4) augmenting the staff in pulp and paper technology at the university; (5) pursuing fundamental and applied research of value to the pulp and paper and allied industries.

Lecture Series Announced

A series of 15 lectures is being given at the university during the spring semester by nationally-known specialists in pulp and paper mill equipment. The series is part of the course requirements for students majoring in the pulp and paper technology section of chemical engineering. The lectures are being arranged by Charles M. Howell, lecturer in paper technology. Head of the department is Prof. Lyle C. Jenness.

Lectures already presented include the following: "Rubber Roll Coverings—Density, Thickness, Etc.," E. W. Peterson of Stowe Woodward Inc.; "Suction Rolls, Couch, and Press," Leon Smith of Downingtown Mfg. Co., and "Stock Pumps, Selection, Operation and Maintenance," G. G. Fintak, Allis-Chalmers Co.

Multiple Underwriter

Great Northern Paper Co. has been named the first multiple scholarship underwriter in the university's Pulp and Paper Foundation. The firm, operating three mills in the state, subscribed $5,000 toward the Foundation's scholarship fund.

Great Northern was the first pulp and paper concern to become a "company member" in the Foundation two years ago, and this latest subscription gives it the distinction of being the "first multiple scholarship underwriter." John B. Calkin, director of the Department of Industrial Cooperation at the university, said the $5,000 would be added to the Foundation's scholarship fund for "worthy students majoring in pulp and paper technology."

Maine Foundation Announces New Committee Members

T. W. Prescott, chairman of the publicity committee of the University of Maine Pulp and Paper Foundation, has announced the names of three new committee members. Mr. Prescott is assistant advertising manager of Scott Paper Co., Chester, Pa.

Those newly appointed to the group include Ralph M. Leighton, Stowe Woodward, Inc., Newton Upper Falls, Mass.; Enright A. Ellis, president of Downingtown Mfg. Co., Downingtown, Pa., and Samuel Shane, public relations department of St. Regis Paper Co., New York, N.Y.

OPS LAKE STATES pulpwood consumers IAC meeting held recently; those attending were (clockwise around table): Edgar Habighorst, American Excelsior Corp., Chicago; Gordon B. Bonefield, American Box Board Co., Grand Rapids, Mich.; W. H. Hildebrand, Mead Corp., Escanaba, Mich.; Edward Gorman, St. Regis Paper Co., Black Duck, Minn.; H. R. Palmquist, Marathon Corp., Rothschild, Wis.; Andrew M. McBurney, chief of the Pulp, Paper and Paperboard Branch of OPS; Henry C. Waldo, OPS consultant; Claude O. Brown, chief of the pulpwood section of OPS; M. C. Walsh, assistant director of the OPS forest products division; John H. Vogel, OPS economist; Walter B. Moulton, OPS Office of Advisory Committees; C. R. Seaborne, Thilmany Pulp & Paper Co., Kaukauna, Wis.; E. B. Hurst, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., F. M. Hilden, Minnesota & Ontario Paper Co., International Falls, Minn.; and C. G. McLaren, National Container Corp. of Wisconsin, Tomahawk

Pulpwood Ceiling Discussed at Lake States Consumers IAC

Proposals to make certain amendments to CPR 107, covering Lake States pulpwood, were discussed recently by members of the Lake States Pulpwood Consumers Industry Advisory Committee and the Office of Price Stabilization. It was the second such meeting, the first being held April 17, 1951. The recent meeting was called as a result of protests by some producers against the current ceilings for Lake States pulpwood.

Mixed opinions were expressed by committeemen regarding the general level of prices spelled out in CPR 107. Most members felt they were adequate. One suggested that the principal objection from producers came from the fact that the regulation was issued in December in the middle of the season, after some producers had made commitments higher than current ceilings on the basis of prices under the General Ceiling Price Regulation.

Members of the committee said much pulpwood was selling below ceilings, and a surplus had been produced at the present price levels. If ceilings were raised to meet complaints from producers, one member suggested, the effect would be merely to pass through the

increase, which would be added to the price of stumpage.

One committeeman declared that he saw no objection if producers and consumers, who had contracted sales at prices higher than those spelled out in the current regulation, were given the option of using their contract prices for the balance of the season, ending April 30. Others said it would be impractical to make the adjustment at this late date. They said despite complaints by producers many contractors had overshipped.

Provisions for commission men were discussed. CPR 107 authorizes payment of commissions to dealers of 7 per cent and to traders of 3 per cent. To qualify for a commission a dealer must sell 5,000 cords each season. A trader must sell 500 cords each season. A dealer or trader must wait until he has handled the required amount each season before receiving his commission.

Committeemen recommended that sales by dealers and traders made in one season should qualify them to accept commissions the following season without waiting. They said it was a hardship for dealers and traders to wait for payment until they made the volume requirements, and that it involved accounting complications.

The amounts of commission allowed and the volume of sales required to qualify were discussed, bringing out the fact that there were varying practices as between consumers and areas. Though some objected to the current provisions, there was no unanimity as to what changes should be made, if any.

Lower Deduction Recommended

Committeemen recommended that the deduction from the f.o.b. car ceiling for pulpwood piled at railroad sidings be reduced from $1.50, as at present, to 50 cents per cord. Committeemen said the 50-cent differential was common in the area (Minnesota, Wisconsin, and Michigan).

Members also recommended that no change be made in provisions for mixed shipments. The regulation says that unless separated by stakes mixed species should take ceilings of the lowest priced species included. Committeemen reported the regulation followed the general custom, though in some areas it was said the different species were tallied by percentage based on count.

Committee members suggested that the present provisions of the regulation covering allowances for truck hauls be maintained, except for the lower peninsula of Michigan. The regulation authorizes additions of $1.50 to the f.o.b. car ceiling for pulpwood delivered to the mill yard. OPS reported there had been some objections from producers making long hauls. Committeemen reported the prescribed differential was common in the industry, and that producers elected to haul in some instances up to 65 miles at the premium in preference to shipping by rail.

Haulage Rates Asked

Committeemen from the lower Michigan peninusla asked that their area be set apart in a separate zone or in a different regulation, so that they could obtain special treatment for practices peculiar to their area. One suggested that the delivered mill price be determined by deducting $2.50 a cord from the f.o.b. car ceiling as a base and then adding the following amounts for indicated hauls: up to 20 miles, $3.00; 20 to 40 miles, $4.00; 40 to 60 miles, $5.00; 60 to 80 miles, $6.00; 80 to 100 miles, $6.50; 100 to 120 miles, $7.00, and over 120 miles, 25 cents for each additional 20 miles.

It was proposed that commissions in this area be changed to allow one commission of $1.00 per cord to anyone selling 500 cords or more a season. It was further suggested that the same level of prices be maintained in the southern peninsula, with adjustments to cover certain lengths peculiar to that area. Some members spoke in favor of a contract loggers regulation for the area similar to CPR 48, which applies to New England and part of New York.

The meeting was conducted by M. C. Walsh, assistant director, forest products division, and Claude O. Brown, chief, pulpwood section, OPS.

Industry Notes

$400,000 in Kraft Paper
was destroyed by fire March 17 at St. Regis Paper Co., Pensacola, Fla. About 2,500 rolls of paper stored outside the bag plant were also ruined or partially damaged by the blaze.

Rayonier Inc.
will continue to produce at full capacity through the second quarter, according to an announcement by President Clyde B. Morgan. First quarter sales topped those of the first three months of 1951.

Unger Paper Co.
is a recently formed concern at 211-215 West 20th St., New York, N.Y. The firm will specialize in laminating of papers, cardboard, foils, fabrics, glassines, and acetates in roll-to-roll and roll-to-sheet form.

Marathon Corp.
will offer a $3,000 four-year engineering scholarship to a 1952 high school graduate. Students from any of four Wisconsin high schools are eligible. The schools are located in Neenah, Menasha, and Wausau.

TURNING THE FIRST SHOVEL, F. C. Boyce, president of D. J. Murray Mfg. Co., signals construction of an addition to the firm's Wausau, Wis., plant. The 115 by 126-foot two-story structure will add 37,000 square feet to present facilities, providing more space for assembly purposes and also under cranes for doing larger types of work. Others in the picture are (l to r): A. W. Plier, executive vice president and general manager; H. G. Beck, president of the Wausau Chamber of Commerce; Herbert A. Giese, mayor of Wausau; Walter G. Roehl, secretary of the chamber, and Irving A. Obel, architet

$7,500 Damage
was caused March 18 in a fire that swept the offices of Austill Waxed Paper Co., Jacksonville, Fla. The blaze destroyed office equipment, company records, art work, engravings, and a quantity of paper.

American Paper Co.,
formed in 1926, has observed its 25th anniversary by establishing an employees' 25 years' service organization. Three employees make up the initial eligible group.

International Paper Co.
has reported that an incentive stock option plan for key employees has been recommended by the board of directors for approval by stockholders at the annual meeting May 14. The plan provides for granting options on a total of 250,000 shares of presently authorized but unissued common stock. Shares may be purchased under the options on the basis of 95 per cent of the fair market value on the date a particular option is granted. Options will permit purchase of 20 per cent of the optioned shares after each of the first five anniversaries of the option date.

Bagley & Sewall Closes New York Office

Bagley & Sewall Co., Watertown, N.Y., has announced that effective April 1 the New York City office at 500 Fifth Ave. was discontinued. All business pertaining to winders, paper machines and other equipment manufac-

are you opening up sales opportunities?

You are if YOUR paper is made from Curlated pulp and has all of these *plus* properties . . .

1. Maximum Tearing Strength
2. Maximum Stretch
3. Maximum Bulk
4. Maximum Bending Properties
5. Maximum Cleanliness
6. Maximum Cross Directional Strength

Only obtainable by Curlation

Yes, only Curlation can give your paper *all* these properties mechanically because Curlation not only changes the shape and diameter of fibers, but reduces fiber bundles and dirt. Curlator's patented rubbing and rolling process twists and flexes fibers under pressure . . . changes them permanently from straight to "curled." Thus more desirable properties are imparted to the finished paper than would be possible with straight (uncurlated) fibers.

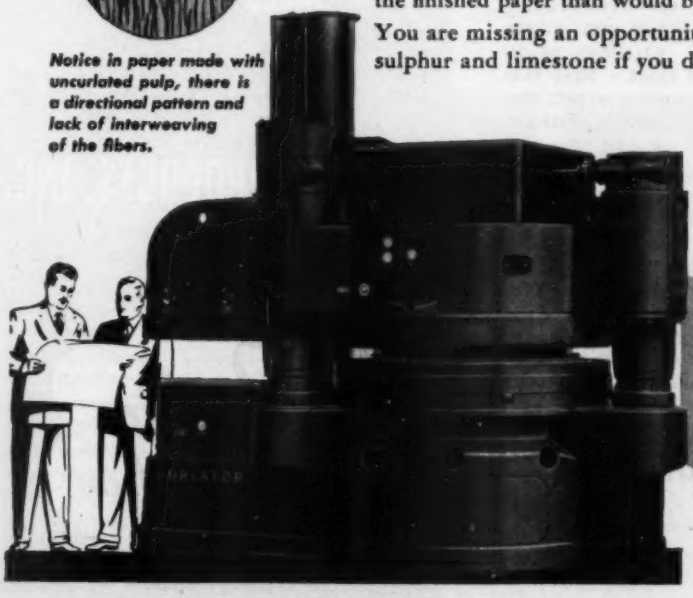
You are missing an opportunity to upgrade pulp, save on wood, coal, sulphur and limestone if you don't investigate Curlators.

WRITE *today for more detailed information.*

Let's look at **CURLATION . . .**

Notice that in paper made with Curlated pulp, the fibers are interlocked and lie in every possible direction.

Notice in paper made with uncurlated pulp, there is a directional pattern and lack of interweaving of the fibers.



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565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

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ONE BIG ORGANIZATION DEVOTED TO IMPROVING YOUR ADHESIVE OPERATIONS

JUST A FEW OF OUR MANY ITEMS FOR YOUR CONSIDERATION:

FOLDING BOX GLUE • FAST SET GLUE • WATER RESISTANT CEMENT • WAX CARTON GLUE • BRIGHTWOOD RESIN GLUE • MST CELLOPHANE WINDOW GLUE • ACETATE WINDOW ADHESIVE • CARTONTITE GLUE • FLATACK NON-WARP GLUE • CAKE FORM NON-WARP GLUE • NON-TARNISH NON-WARP GLUE • STRIPPING GLUE • COMBINING CEMENT • SHIPPING ROOM GLUE • GRIP-TIGHT LABEL PASTE • RESIMENT LABEL CEMENT • COOLER-PROOF BOTTLE LABEL GLUE • ICESTIK BOTTLE LABEL GLUE • IMMERSIT BOTTLE LABEL GLUE • CAN LABELING ADHESIVES • BOXEAL SHIPPING CASE GLUE • WATER RESISTANT SEALING GLUES • PLASTICS FABRICATING CEMENT • FOIL TO PAPER CEMENTS • FELT TO METAL CEMENT • RUBBER TO METAL CEMENT • WOOD WORKERS' GLUE • LIGNOTITE CASEIN WOOD GLUE • FLEXTACK FLEXIBLE COVER GLUE • SMYTHE CASE-MAKING GLUE • PLIAFLEX CEMENT FOR COATED PAPERS AND CLOTH • INTERLEAVED CARBON FORM ADHESIVE • RUBBER CEMENT • BOOKFLAT CASING-IN PASTE • PYROXIFLAT CASING-IN PASTE • PLIABOOK CEMENT FOR GLUING-OFF AND LINING-UP • OVER-INK REMOISTENING GUM • LAYFLAT COLORLESS REMOISTENING GUM • MOISTURE-PROOF CELLOPHANE CEMENT • CELLULOSE ACETATE FILM CEMENT • LAYFLAT MOUNTING PASTE • RESIN CASE-MAKING CEMENT • ALUMINUM FOIL LAMINANT • COATED PAPER AND PLIOFILM CEMENT • FLEXIBLE LINING-UP GLUE • FLEXIBLE GLUING-OFF GLUE • SEWING MACHINE PASTE • BOOK LABEL ADHESIVE • HOT PADDING GLUE • ALL-PURPOSE CEMENT • PLIATAB COLD PADDING GLUE • PRINTERS MAKE-READY PASTE • PAISLEY SPRAY FOR OFFSET PREVENTION • WATER AND GREASE RESISTANT TUBE GLUE • PAPER ROLL SPLICING GLUE • PYROXYLIN COATED CLOTH AND PAPER ADHESIVE • ASPHALT COATED PAPER ADHESIVE • WAXED-GLASSINE PAPER ADHESIVE • SPOT LABEL GUM • PALMER CARTON FORMER ADHESIVE • BAG SEAM ADHESIVE • NON-HYGROSCOPIC GLUES • PAISLEY DEHIDRI GLUE CRYSTALS • PLACO LIQUID WALL SIZING • WALLPAPER PASTE • PAISTICK OFFICE PASTE • CALENDAR TIP-ON PASTE • GREETING CARD PASTE • MAILING MACHINE PASTE • HEAT SEAL COATINGS • PAISOL GUM IMPROVER • KRAFT SEAL GUM • FRONT SEAL GUM • COIN ENVELOPE MACHINE GUM • HAND FOLD PASTE • TROPICAL FRONT SEAL GUM • COLORLESS FRONT SEAL GUM • AIR MAIL SEAL GUM • BOND SEAL GUM • GLASSINE WINDOW PATCH GUM • ACETATE WINDOW PATCH GUM • ROTARY FRONT SEAL GUM • PLUNGER FRONT SEAL GUM • ROTARY BACK SEAM GUM • PLUNGER BACK SEAM GUM • THREE STAR TEXTILE OIL • NOX-FOME TEXTILE SIZING DEFOAMER • A. R. N. NO. 3 WARP SIZE • A. R. N. NO. 8 WARP SIZE • M. N. T. CONCENTRATE CATALYTIC SOFTENER AND NYLON SIZING • RESILEX NC-8 WARP SIZING • PENETRA-SET YARN FIBRE CONDITIONER • COTTON WARP SIZING • RAYON WARP SIZING • SYNTHOGEL • CARPET AND FELT SIZING • PRINTING GUMS FOR TEXTILES • TAPIOCA DEXTRINES • CORN DEXTRINES • POTATO DEXTRINES • RESIDEX WATER RESISTANT LAMINATING GLUE • PAPER MILL SPECIALTIES.

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CIRCLE ITEMS . . PASTE AD ON LETTERHEAD . . MAIL TODAY TO OUR NEAREST OFFICE IN NEW YORK CITY OR CHICAGO

ESTABLISHED 1851

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New York 19, New York

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Houlton, Maine

MAGIC VALLEY PROCESSING CO.
Twin Falls, Idaho

NEW ENGLAND STARCH CO.
Houlton and Mars Hill, Maine

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Paisley
SCIENTIFIC ADHESIVE SERVICE

tured by the firm is to be handled directly from the home office.

At the same time the resignations of three officials were announced. T. Carter and E. Peterson of the Watertown office resigned as of March 1. Joseph Scheuermann, vice president in charge of the converting machinery division at New York, was to have resigned as of April 15. (See Necrology for Mr. Scheuermann's death.)

The management feels that it will be in a position to give better service to customers in the handling of all work directly from the plant, coordinating sales, engineering, and manufacturing.

Canadian International Trade Fair Scheduled for June

Canadian business and industry is backing Canada's International Trade Fair to a greater extent than ever before. Already, Canadian space bookings are well ahead of either the 1950 or 1951 fairs. When the two-week show opens June 2 in Toronto, Canadian participation may be almost double what it was last year. To date, 45,000 square feet of exhibit space have been booked. This is 3,000 square feet more than Canadian exhibitors occupied last year, and space applications are still being received. Products will be shown in every one of the 16 trade categories into which the exhibition is divided.

The most noticeable increase is in the section containing machinery and plant equipment. Here, Canadian manufacturers have booked 20,000 square feet to show a diverse selection of machine tools and heavy and light machinery and equipment for almost every type of industry. Eleven of the approximately 30 countries expected to participate have submitted formal space applications.

Texas A. & M. Announces Instrumentation Symposium

The Agricultural and Mechanical College of Texas has scheduled its 1952 Symposium on Instrumentation for the Process Industries for June 2 through 4 at the Memorial Student Center in College Station. Held in cooperation with industrial firms of the Southwest, the meeting is sponsored jointly by manufacturers of instrument and control equipment.

Designed to provide balance between theory and practical experience, the program will again include subjects related to the measurement and control of process variables, with recognition of new developments and current trends of the industry. The course will be conducted as a seminar, with lectures leading into discussions of various phases of this growing science, making it of important value to instrument, process design, and operating engineers, and management executives.

DRAFTING DEPARTMENT operations are studied by seniors from Beloit (Wis.) High School as they toured Beloit Iron Works recently. F. J. Behrman (left) acts as guide; R. G. Tangye is at the drawing board. The group was part of 60 students who visited the plant in a program directed by T. G. Chekouras of the personnel department

Among subjects to be discussed in this, the seventh annual, symposium include: Instrumentation of Industrial Waste Disposal Processes, University Training in Instrumentation, On-the-Job Training in Instrumentation, Survey of Oxygen Analyzers, Instrumentation of a New Type Hydroformer, Instrumentation Flow Sheets, Furfural Extraction of Lubricating Oils, Butterfly Valves, Gadgeteering in Chemical Plants, and so on.

Allied Notes

Bird Machine Co.
is planning the opening of a new sales and service headquarters on the Pacific Coast, with Blanchard D. Warren, assistant sales manager, in charge. Bird Machine considers the move timely and a logical expansion of its facilities in view of the pulp and paper industry's constant development in the region.

B. D. Warren

D. E. Stenson

Lynch Corp.
opened an Eastern District office in New York, N.Y., February 1. A stock of emergency repair parts for Lynch packaging machines will be maintained. The office is to be under the management of D. E. Stenson, who has served as eastern sales manager for the Par Division for a number of years.

Sterling Electric Motors, Inc.,
Los Angeles, has opened new sales offices in Tulsa, Okla., and Buffalo, N.Y. B. G. Jordan has been appointed manager in Tulsa. In charge at Buffalo is J. W. Byrnes, formerly with Colonial Radio Corp., a subsidiary of Sylvania Electric Corp.

Wheelco Instruments Co.,
Chicago, has been purchased by Barber-Colman Co., Rockford, Ill. According to the announcement, present plans are to continue current operations in Chicago until such time as manufacturing facilities can be gradually transferred to Rockford. No changes are contemplated in Wheelco's national sales and service organization.

Beckman Instruments Inc.,
Helipot Corp., and Arnold O. Beckman, Inc., have announced that about 40 acres have been acquired in the Fullerton-LaHabra, Cal., area for the construction of facilities for the development and manufacture of precision instruments and electronic equipment.

Eutectic Welding Alloys Corp.
has reported the creation of two new regional sales offices. Sales activities in Los Angeles and the West Coast are to be supervised by Robert B. Welch; while Woodrow W. Shackleford has been named to head the new sales regions established for Buffalo and upstate New York.

Detrex Corp.,
Detroit, has announced the creation of a new products department and the appointment of John P. Emmett as its head. He will handle the market research and sales development of all new products while they are in the pre-marketing phases and will oversee the company's

program of market expansion, which involves the acquisition of raw materials in the manufacture of future product developments, as well as the expansion of plant facilities.

U. S. Rubber Co.
has announced the purchase of the Stoughton, Wis., plant of Milprint, Inc. The plant was built by Milprint in 1947 for the manufacture of plain and printed vinyl films. It has a floor space of 39,000 square feet and employs about 100 people. U.S. Rubber will use the facility for the production of new products, principally lightweight, unsupported and supported plastic films.

Industrial Nucleonics Corp.,
Columbus, Ohio, has completed a new research and engineering building. Nucleonics manufactures the AccuRay beta gauge now being used in the rubber, plastics, paper, and metals rolling industries.

Hercules Powder Co.,
Wilmington, Del., has announced that a substantial part of the firm's annual $5,000,000 research budget is being allotted to research for the paper industry market. Part of the work is being carried on at the experimental station in Wilmington, while the remainder is conducted in the laboratories of Hercules papermaking chemical plants.

Heppenstall Co.,
Pittsburgh, has appointed Stanley J. Leen Co. of Brewer, Maine, as sales representative to the pulp and paper industry of Maine, New Hampshire, and Vermont.

Hooker Electrochemical Co.
is sponsoring a research fellowship in chemical engineering at the University of Washington. While no specific assignment has been made, the research will be concerned with the uses of caustic soda and chlorine as related to the use of waste products of the pulp industry, such as lignin.

Ohio Knife Co.,
Cincinnati, is adding 30,000 square feet of production area to its present manufacturing plant. The current project is the fourth major expansion undertaken in the past 10 years.

Goodyear Tire & Rubber Co.,
Akron, Ohio, has announced a new vinyl resin latex designed for coating papers and fabrics for resistance to grease, chemicals, and moisture.

Westinghouse Electric Corp.,
Pittsburgh, will sponsor nationwide radio and television coverage of the 1952 presidential election campaigns over CBS networks. Both Republican and Democratic conventions will be included, as well as the general elections.

Fine Organics, Inc.
has approved plans to enlarge buildings to house increased laboratory and production facilities at the Lodi, N.J., plant. Additional process equipment orders have been placed to enlarge the firm's capacity to produce intermediate chemicals, pharmaceuticals and fine organics.

Hewitt-Robins Inc.,
New York, N.Y., has formed a new south central sales division. The area includes Texas, west Tennessee, Oklahoma, Arkansas, Louisiana, Mississippi and Alabama, with headquarters at Houston. L. C. Holloman, with Hewitt-Robins since 1939, is the assistant division manager in charge.

John Salzer & Co.,
Tampa, Fla., has been appointed sales representative for Bowes Industries, Inc., Chicago.

Dominion Foils (Canada) Ltd.
has changed the company name to Aluminum Rolling Mills Ltd. The firm announced that the new name has been adopted so as to better describe the expanded mill operation at Cap de la Madeleine, Que. Present capacity includes casting, rolling aluminum sheet and strip, aluminum foil and packaging materials.

Mount Hope Machinery Co.,
Taunton, Mass., has designated the Dan E. Charles Agency, Seattle, as its field representative in Idaho, Oregon, Washington, and British Columbia.

Anchor Chemical Corp.,
Brooklyn, N.Y., has appointed Saxon Paper Corp. of New York, N.Y., as a distributor of PAM-X, a synthetic flexible padding adhesive.

Denver Equipment Co.
has appointed two distributors in the north central territory. Road Machinery Supply Co., Duluth, will handle Denver products in northern Wisconsin and northern Minnesota, while Charter Inc. of Ishpeming, Mich., has been named to handle the Upper Peninsula of Michigan.

Western Precipitation Corp.
has announced the opening of Atlanta offices. K. H. Cree is to be in charge. The area to be served includes Georgia, Tennessee, Mississippi, Alabama, Florida, and eastern Louisiana.

"Corrosion in Action"
is the title of a new color sound film prepared under the direction of International Nickel Co., Inc. The film shows how corrosion works to cause an annual loss in industry and elsewhere estimated at more than six billion dollars. It also shows how this damage can be avoided or controlled by various means.

Stanolind Oil & Gas Co.
has announced construction plans for its second sulphur recovery unit in west Texas. The unit is to be adjacent to the Stanolind-operated natural gas plant 15 miles northwest of Odessa. Completion is scheduled for early 1953. The plant is to have a capacity of 17.7 long tons per day.

Roots-Connersville Blower Corp.
has been absorbed into the corporate structure of its parent, Dresser Industries, Inc., and is now known as the Roots-Connersville Blower Division.

Harnischfeger Corp.,
Escanaba, Mich., truck crane manufacturer, has announced the contemplated expansion of its plant. The firm has been granted a certificate of necessity covering 50 per cent of the estimated cost of $646,844.

Increased Tonnage Capacity Forecast by Eastern Exec.

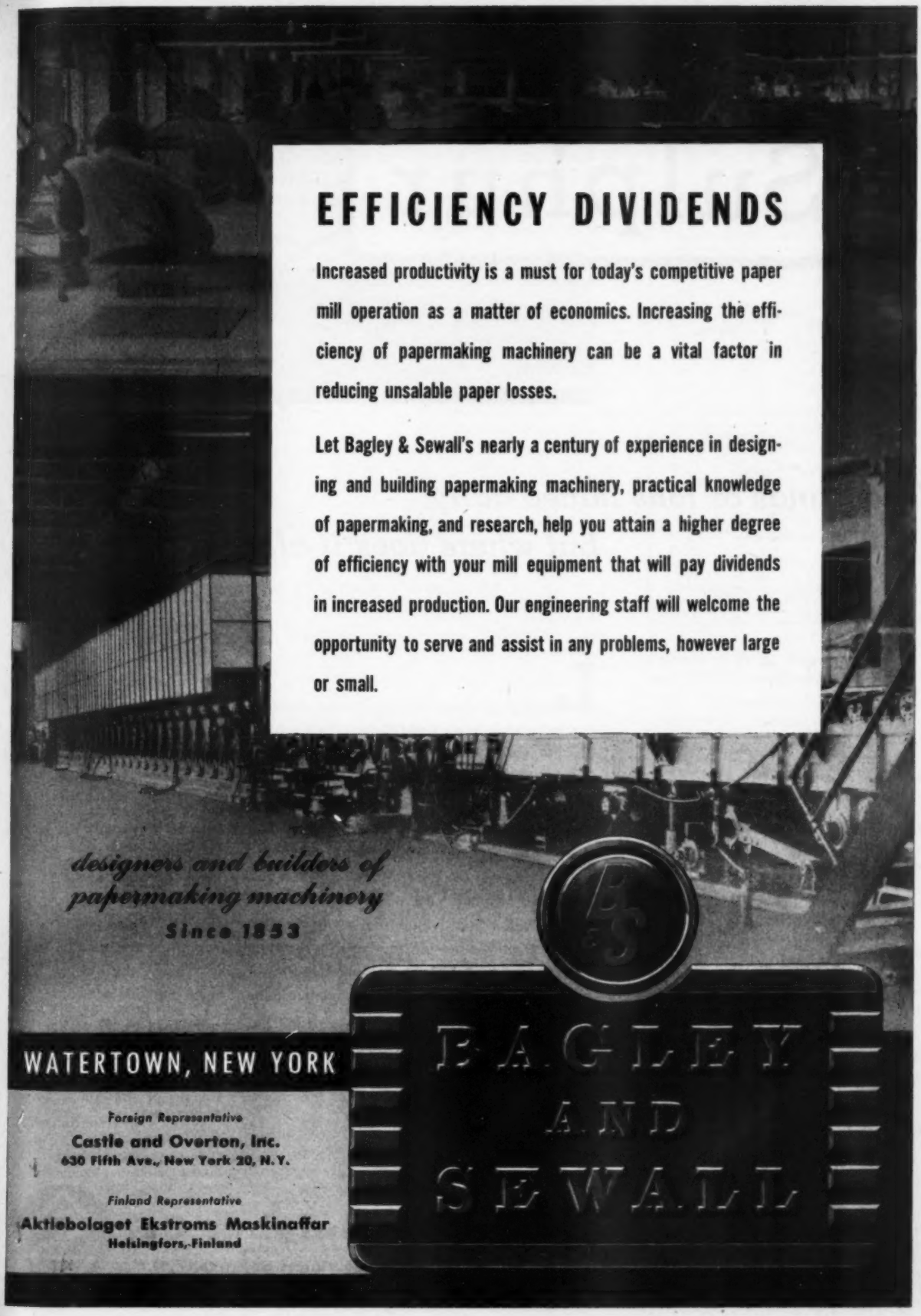
Increased productive capacity for the paper industry in 1952 was forecast recently by John E. Massengale, sales vice president for Eastern Corp. He addressed a company luncheon during the annual convention of the National Paper Trade Association in New York, N.Y.

"By the end of 1952," Mr. Massengale declared, "there will be a capacity of nearly 26,500,000 tons, and at the end of 1953 the capacity will be a little over 27,000,000 tons. Whether the demand will keep up with this capacity, nobody knows. I can only say this to you—as long as defense spending continues at this very high level, I cannot see how we can have a slump in the writing paper division. You just cannot do 60 or 70 or 80 billions of dollars of business without using a tremendous amount of writing paper. Some of our forecasters have predicted an easing in demand. If the present world tension continues, I cannot see it."

Reduced Production Hits Northern New York

With paper manufacturing throughout the country running at a high percentage of capacity, some reduced production has hit certain of the northern New York mills. A difference of opinion among manufacturers prevails as to the cause.

Over-inventories of stocks on hand at the beginning of the year is the answer given by some producers. Over-inventories plus worry concerning the


EFFICIENCY DIVIDENDS
Increased productivity is a must for today's competitive paper mill operation as a matter of economics. Increasing the efficiency of papermaking machinery can be a vital factor in reducing unsalable paper losses.
Let Bagley & Sewall's nearly a century of experience in designing and building papermaking machinery, practical knowledge of papermaking, and research, help you attain a higher degree of efficiency with your mill equipment that will pay dividends in increased production. Our engineering staff will welcome the opportunity to serve and assist in any problems, however large or small.
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Helsingfors, Finland

Sulphur

Molten Sulphur flowing into the storage vat

Thousands of tons mined daily, but where does it all go?

Look around you in any grocery store and what do you see — canned goods of all kinds! Soups, vegetables, fruits, berries! Believe it or not, you're looking at merchandise that consumed a lot of Sulphur in the making.

Tin cans are made of tin plate. Tin plate is made of sheet steel. Sheet steel is made with the help of sulphuric acid—pickling, as they call it, the process that removes scale preparatory to plating. In 1951, the sheet division of our great iron and steel industry is estimated to have consumed 140,000 long tons of Sulphur in the form of sulphuric acid. That in itself makes quite a dent in our supplies of Sulphur. Add to this almost as much more for treating wire rod, plate, strip, bars, etc., and you can see that to make finished steel, regardless of form, the iron and steel industry must use lots of Sulphur in the form of sulphuric acid.

Right here is an excellent example of the interdependence of all of our industries. To produce steel requires a lot of Sulphur. To produce Sulphur and other mined products requires a lot of steel. This interdependence of industries is one of the country's sources of strength.

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas

steel strike situation is the reply given by others. In the fine paper segments of the industry business is reported to be progressing at a normal level. According to reports, in some of the tissues and boards the story is not so good.

At St. Regis Paper Co.'s big six-machine Deferiet mill, which produces fine printing and converting papers, operation is on full time, and the demand for printing papers is flush. For converting paper, however, demand is off considerably.

Knowlton Bros. Inc., operators of Kamargo Mills producing a variety of specialty papers, was running its mills on short time during January and a part of February but is now moving along in a better situation with a better tone reflected in its market, although full production has not yet been reached. The tone in the wholesale end is also showing improvement, and the firm is disposed to attribute the softness early in the year to over-inventories.

Brownville Paper Co., which produces bonds and other fine papers, has reported good business and full-time operation, it was said. On the other hand, at Brownville Board Co., although there is 100 per cent operation, business is not as good as predicted.

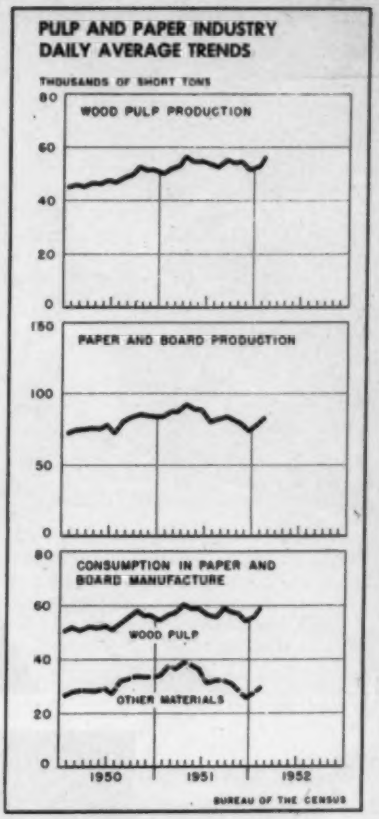
Officials of Dexter Sulphite Pulp & Paper Co. could not be reached to confirm or deny reports that the plant had been shut down for a week and that an effort was being made to have employees take their two-week paid vacations at this time. From the village of Dexter, however, came the information that the company has a substantial wood pile and is maintaining a crew to unload all pulpwood shipments. Reports also have it that the plant is not producing paper products at this time.

That Dexter will not embark on the manufacture of glassine papers as it planned in 1945, when it ordered a 130-inch fourdrinier from Bagley & Sewall Co., has been definitely determined. The machine, which was delivered to the mill about two years ago, has remained crated and has been sold to Hammermill Paper Co., Erie, Pa. One of the reasons given by Dexter for the decision not to utilize the new machine is the necessity for the construction of a building in which to house it. At present labor and construction prices, the cost was regarded as prohibitive.

U. S. Paper and Paperboard Production

	Feb. 1952 (tons)	Jan. 1952 (tons)	Feb. 1951 (tons)	Total 1951* (1,000 tons)	Total 1945 (1,000 tons)
Paper and Board, total	2,006,249	2,104,836	2,103,347	26,086	17,371
Paper, total	953,791	1,028,618	904,598	11,622	7,574
Newsprint	87,816	96,330	82,900	1,106	725
Groundwood paper (uncoated)	71,529	76,780	58,770	789	636
Printing and converting (coated)	91,353	99,713	85,664	1,115	1,501[3]
Book paper (uncoated)	128,063	139,490	135,478	1,622	
Fine paper (writing, cover and text, bristols, thin paper and other)	122,133	126,753	99,753	1,364	1,001
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment and other)	293,398	320,281	275,284	3,597	2,403
Special industrial paper	36,539	35,899	34,130	419	238
Sanitary paper	96,451	105,105	95,380	1,215	824
Tissue paper	16,611	18,317	26,362	270	157
Absorbent paper	9,898	9,950	10,877	124	89
Paperboard, total	848,310	880,505	972,972	11,605	7,907
Containerboard, total	448,850	474,403	531,035	6,347	4,131
Liners	303,385	319,656		4,205	
Corrugating material	121,509	130,338	151,509	1,815	
Container chip	23,956	24,409	(2)	328	
Bending board (folding boxboard)	247,637	257,399	292,464	2,429	2,092
Non-bending board (set-up boxboard)	61,023	63,607	73,401	701	721
Cardboard	5,994	5,747	6,590	79	71
All other paperboard	84,806	79,349	69,482	1,849[3]	891
Wet machine board	10,973	11,394	13,768	144	112
Construction paper and board, total	193,175	184,319	212,009	2,716	1,778
Building paper and insulation	94,366	89,635	120,068	1,401	883
Hardboard and insulating board	98,809	94,684	91,941	1,315	895

*Preliminary report. [3]Total for 1945, combining printing and converting paper and book paper. (2) Data not available due to revision of classifications. [3]The figure shown for "All other paperboard" (other bending board, other non-bending board, and special paperboard) does not include production during January 1951. This figure for January is 199,022 tons and is included in the "Paperboard" total. *Source: U. S. Department of Commerce.*



February Pulp, Paper and Board Production

February paper and board production amounted to 2,006,249 tons, according to a report released by the Bureau of the Census. This is 5 per cent less than the tonnage produced in February a year ago. In terms of production base capacity, the industry operated at 79.6 per cent in February, with the paper and paperboard sections operating at 89.8 and 73 per cent respectively. The comparable ratios for January were: Total, 74.5 per cent; paper, 86.8 per cent, and paperboard, 67.3 per cent.

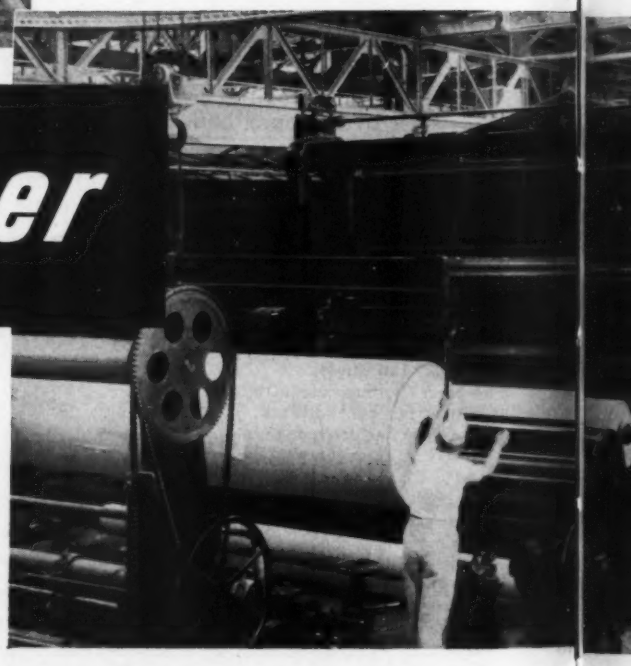
Pulpwood receipts at the pulp mills during the month were 2,560,385 cords, with consumption at 2,217,222 cords. Month-end inventories increased 6 per cent to 5,786,553 cords.

Wood pulp production during February amounted to 1,369,524 tons. In terms of production base capacity, pulp production ran at 89.7 per cent, as compared to 83.5 per cent in January of this year.

Wood pulp inventories at the end of February at the paper and board mills were 502,646 tons, as compared to 494,862 tons reported at the end of January. Month-end stocks at the pulp mills increased from 99,460 tons to 103,018 tons.

from pulp logs

to paper



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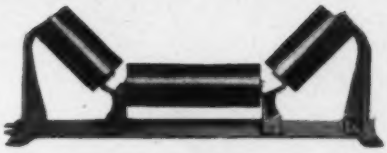
REX

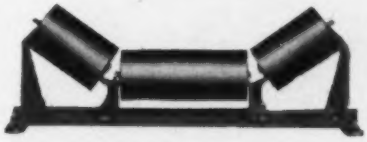
BALDWIN-REX®

REX® COMBINATION DUROBAR® CHAIN has inside block links of malleable iron or Rex Z-Metal, and side bars of high carbon steel. These husky chains are great favorites for all types of conveyor service in pulp and paper mills. Eccentric barrel construction makes for better sprocket action and greatly reduces chain wear.



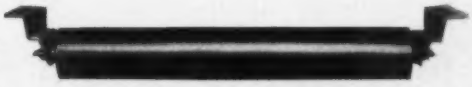
REX WOOD CHIP IDLERS are sloped to a steep 45° angle to greatly increase belt capacity. Chips can be piled higher and loaded closer to the belt edge without fear of spillage. Have same long-life design features as Rex standard idlers.

REX CHABELCO® STEEL CHAIN combines relatively light weight with high strength. It is used in both drive and conveyor service . . . can handle heavy loads and withstand severe shock and vibration. For those really tough jobs, you can't beat Rex Chabelco.



REX STANDARD TROUGHING IDLERS are used for wood chip, bark and pulp handling. Roller or ball bearing equipped interchangeable rolls are supported in brackets of unbreakable malleable iron. Triple labyrinth grease seal keeps grease in . . . dirt out.

BALDWIN-REX® ROLLER CHAIN is a high strength precision steel chain suitable for high speed drive service. It is available in single, double, triple and quadruple strand in a complete range of sizes and strengths to suit every driving requirement. Pitch range is from ¼" to 2½".



REX RETURN IDLERS are of the dead shaft type and are of the same rugged construction as Rex Troughing Idlers. Positive grease seal assures smooth operation through years of continuous service. Rex also makes flat belt idlers, impact idlers, self-aligning idlers and spiral return idlers.

REX FLAT SPRAY NOZZLES are ideal for cleaning logs as they emerge from woodyard or log pond. Their hard-hitting, knife-like sprays of water effectively remove sand, gravel, dirt and grit from logs. Special design permits maximum impact value with low water consumption.

REX BUCKET ELEVATORS are widely used for elevating wood chips, refuse and similar material. There is a Rex Standard Bucket Elevator to meet virtually every requirement of the pulp and paper industry. All major components . . . buckets, chains, sprockets, housing, etc. . . . are manufactured by Chain Belt Co., assuring you a uniform, reliable, easy to maintain unit.

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AIR VIEW of National Gypsum's new $5,000,000 paper mill at Pryor, Oklahoma

Push button operation in Oklahoma as . . .

National Gypsum puts 25th plant into operation

National Gypsum's $5,000,000 push button paper mill began operation at Pryor, Oklahoma last January. Located on a 49-acre site acquired from the Grand River Dam Authority, the new mill converts waste paper into a bonded eight-layer sheet used for lining gypsum board, lath and sheathing.

This is the latest addition to National Gypsum's 25 plants advantageously dispersed over a wide area in the United States and Canada. Running smoothly under the direction of Paul Dumas, plant manager, Eugene E. Nooe, mill superintendent, and R. L. Harris, maintenance engineer, the mill provides employment to 75 persons, most of whom are residents of Pryor.

The location of the plant follows a well-established company pattern of placing its plants at strategically sound points and near geographical centers of important markets. The Southwest, which is becoming highly industrialized, constitutes such a market. Said Melvin Baker, National Gypsum board chairman, who has been the driving force behind their amazing growth: "National's faith in the ultimate success of Southwestern industry has been expressed by our investment in its future. We have put our money into the markets of the South. Oklahoma, as one of the dominant areas of the Southwest, will play an important role in a new, more prosperous South. Its location and its maturity as an industrial site make it the logical spearhead of southern industry's advance, and National Gypsum has a pardonable desire to share in this expansion of the free enterprise system."

The Southwest is already served by three of the company's gypsum board plants, located at Rotan, Texas; Medicine Lodge, Kan., and Fort Dodge, Iowa. It was the necessity of supplying these plants with their paper requirements that prompted the company's decision to erect the new paper mill whose entire production of laminated paper sheet, amounting to 150 tons a day, is utilized for this purpose. Before this plant went into operation, National's 10 wallboard plants were supplied by only three company-owned paper mills, which provided 75 percent of the company's paper requirements.

The company's history constitutes a record of spectacular growth. Formed in 1925 by Mr. Baker, Joseph Haggerty and Clarence Williams, it started operations with a single plant producing a single product — wallboard — and supplying some 300 dealers. Today the company is a $90,000,000 corporation. It operates 25 plants, manufactures more than 150 products and supplies some 16,000 dealers.

Construction achieved in record

Completely designed by National Gypsum engineers, the construction of the Pryor mill was completed in record time. It went into operation 10 months after its construction was started by Manhattan Construction Co. of Muskogee, Okla. And less than 35 minutes after the initial start-up the first paper was on the reel.

The plant is probably the first paper mill to operate without a built-in power house. Electric power, steam and compressed air are bought under contract from the Grand River Dam Authority whose six turbine generators on the Pensacola Dam are producing 90,000 kilowatts of electric power. There are over five miles of steel, copper, concrete and lead pipes that carry water, steam and raw materials to the various operating sections of the mill. About 2,500 gallons of lubricating oil are in constant circulation to various components and parts of the stock preparation system and paper machine. A Bowser automatic pressure oiling system provides lubrication of the bearings in the entire dryer section and two calender stacks. Spaeth Engineering of Oklahoma City held the contract for the piping installation.

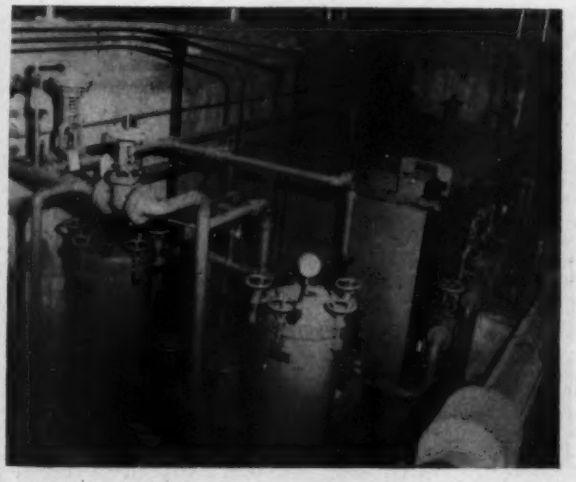
A Terry steam turbine operates the entire line-shaft which, in turn, drives

WET END from the main presses showing the 18-inch rubber-covered couch rolls

FRONT AND SIDE of the dryer section, comprising 100 seamless dryers

FIRST ROLL from new machine inspected by Mill Superintendent E. E. Nooe (on base) and Plant Manager P. J. Dumas (2nd from right)

DRYER DRAINAGE SYSTEM designed and developed by Midwest-Fulton Machine Co.

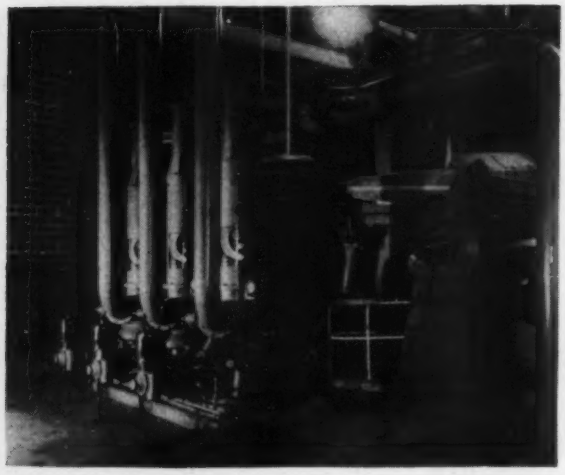


AUTOMATIC PRESSURE OILING provided by Bowser for dryer section and calenders

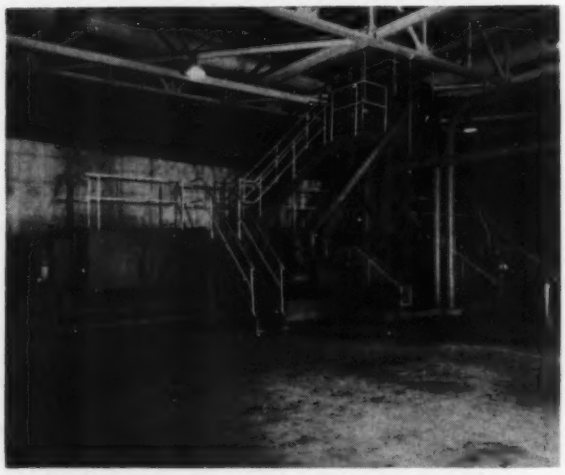
SPIRAL BEVEL GEAR DRIVES by Black-Clawson provide even draws and constant speed in drying and calender operation

INCLINED CONVEYORS for transporting raw materials to the three Hydrapulpers

HYDRAPULPERS in 20-, 14-, and 12-foot sizes are fed by the apron type conveyors

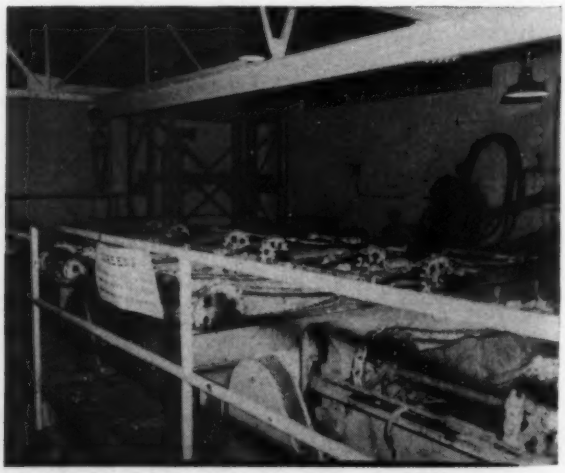


HYDRAFUGE SEPARATORS form vital part of the plant's stock cleaning system



THREE CLASSIFINERS, flow trough, and Shartle air-couch thickeners

JORDANS equipped with Duotrol for automatic plug adjusting from control panel



PACKER TYPE SCREENS by Sandy Hill for the paperboard machine's eight vats

everything from the main presses to the uniform-speed reel — through Black-Clawson spiral bevel gear drives. The wet end of the machine is operated by dc motors which get their current from a dc generator attached to the end of the lineshaft.

Raw materials

The mill's principal raw materials are baled waste newspaper, mixed waste paper, kraft waste and used corrugated boxes. These are used at the rate of 4,000 tons a month and are collected in the larger cities of Oklahoma, Kansas, and Texas. Higher grades of waste paper are also shipped from Louisiana and Georgia. The groundwood pulp is supplied from Canada at a rate of 200 tons a month, while a smaller quantity of 50 tons is obtained from Finland. Other raw materials are smaller quantities of sulphite pulp, alum, and some rosin.

Push button operation

Since World War II National Gypsum has spent $15,000,000 on plant modernization to speed up production and establish greater productivity per man hour. In line with the policy to achieve a maximum degree of productivity per man hour is the installation of centrally-located control panels. The main control station, located immediately adjacent to the wet end of the paperboard machne, affords the operator complete finger-tip control and visual indication of practically every operation in the mill—with the exception of the Hydrapulper and conveyor system and the reel and rewinder.

A separate control station situated at an equally advantageous position in the stock preparation section provides control for the entire continuous Hydrapulper cleaning system, the batch Hydrapulpers and the conveyors.

Control panels at the uniform-speed reel and Cameron winder provide for individual control of these two units.

Contractor for all electrical equipment was Beacon Construction and Engineering Co., of Buffalo, New York.

Suppliers of other electrical controls are as follows: wet end helper-drive controls—by General Electric; press roll loading controls—by Foxboro; size, alum, jordan Duotrols and master control panel—by Shartle Bros.

Stock preparation

Raw materials received at National Gypsum are unloaded and stored on a single floor level. Furnish is carefully proportioned and fed by means of three inclined apron-type conveyors to three Shartle Bros. Hydrapulpers. The larger of these Hydrapulpers is a 20-ft. diameter unit which heads up the continuous filler stock pulping and cleaning system. This system is designed to disintegrate mixed waste paper and to remove all foreign materials from the stock.

The filler stock cleaning system comprises the 20-ft. continuous Hydrapulper equipped with a continuous junk remover and ragger for removal of heavy junk, rags, wire and string. The balance of the system consists of three Hydrafuge separators, three Classifiners, a Disintegrator and a Selectrap for final cleaning operations. The cleansed filler stock is then thickened in three Shartle air-couch thickeners before it is sent to the filler dump chest.

A 14-ft. diameter batch Hydrapulper operating on a 20 min. time cycle is used to disintegrate a better grade of waste paper for bottom and under liner, while lap pulp and other clean furnishes for top liner are slushed in a smaller Hydrapulper which is 12 ft. in diameter.

The filler and liner stocks are stored in three 15,000-gallon glazed tile dump chests made by Kalamazoo Tank and Silo Co. All chests are provided with Shartle propeller agitators driven through Falk reducer units. Shartle pumps are employed throughout the paper stock and white water system.

From the dump chests the stock is delivered to a battery of six Shartle Miami No. 2-A jordans equipped with Duotrol —automatic plug adjusters controlled from the main control panel. From the jordaned stock chests the stock is distributed to eight Sandy Hill Packer-type machine screens, thence to the vats on the paperboard machine.

Paperboard machine

The Black-Clawson 116″ face, eight cylinder paperboard machine is designed for a capacity of 150 tons per day, with a minimum trim of 101 inches at a speed of 500 feet per minute.

Wet end

The vat section comprises six counterflow and two Uni-flo vats with 42″ diameter molds and 18″ rubber covered couch rolls. Shartle Class A centrifugal pumps provide white water service for the vats.

From the molds the sheet passes upwards and over a 30″ diameter suction return drum with a pneumatic loaded top rider roll, then to the primary press section.

The primary press section is made up

National Gypsum Personalities

Melvin H. Baker
Board Chairman

Paul J. Dumas
Plant Manager

A driving force behind the Pryor mill project, *Melvin H. Baker*, chairman of the board, was associated with National Gypsum Co. during its formation in 1925. He served as vice president until 1928, at which time he was chosen president of the firm. He has been board chairman since 1951.

Mr. Baker has led the firm in its development from a newcomer in a highly competitive field to its present status as one of the leading suppliers of building materials, manufacturing more than 150 products in 25 plants.

Born in Sevierville, Tenn., he began his business career as a salesman with Willer Mfg. Co. in 1908. In 1912 he joined Beaver Board Co. as a salesman and became sales manager in 1915. In 1922 he joined the staff of American Manufacturers' Foreign Credit Underwriters, serving as vice president until his association with National Gypsum in 1925. At the present time he is serving as president of Tudor Plaza, Inc., and as a director of both Manufacturers' and Traders' Trust Co. and Kellogg Petroleum Products, Inc., all of Buffalo. He is also a director of the United States Chamber of Commerce, a director of the National Industrial Conference Board, and a trustee of the National Safety Council.

Mill manager at the new National Gypsum installation at Pryor is *Paul J. Dumas*, who brings to his new position a background of almost 21 years in the pulp and paper industry. A native of Lisbon Falls, Maine, he has had direct experience in almost every phase of papermaking.

Mr. Dumas' first experience in the industry was as a mill laborer. In eight years he rose from that position through those of scaler, foreman and mill superintendent to product superintendent. He then transferred to a fibreboard mill, where he served as box plant superintendent for four years. During his time as head of the board plant he also supervised an experimental project for the mechanization of pulpwood logging and handling. Mr. Dumas then returned to the paper industry, again as mill superintendent.

Educated at Maine State Teachers College and at New York University, he spent more than two years in the Army during World War II, after which he re-entered the industry. In the years immediately after the war he served as a mill superintendent, general mill superintendent, plant manager, and vice president in charge of operations. He joined National Gypsum in November of 1950.

of three plain presses and one suction press, floor mounted and equipped with pneumatic loaded top rolls.

The main press section comprises three main presses—all straight through presses—with plain first press, suction second press and a plain third press. The rolls are mounted in anti-friction bearings and the top rolls are pneumatic loaded. Vacuum equipment is provided by Nash Engineering Co.

Dryers

The dryer section comprises one hundred 48" x 114" face seamless dryers arranged in six double deck sections and hooded with a J. O. Ross Engineering Co. hood and ventilating system. The entire dryer section is Sheahan rope carrier equipped and is mounted on high type frames requiring no dryer pit. The dryers, as well as the main presses, calenders and reel are driven from the recess mounted main line shaft through Black-Clawson spiral-bevel gear drives. The calender drives are equipped with reversing drives for quick and safe ejection of plugs. All drives are provided with Fawick Airflex clutches for operation from the front side of the machine. The dryer drainage system was provided by Midwest-Fulton Machine Co.

Finishing end

One seven-roll and one nine-roll calender stack comprise the calender section, while a uniform-speed reel winds the finished paperboard into rolls up to 72" diameter. A sizing unit made by Hercules Powder Co. is incorporated at the calenders. Electric roll lifts at the calenders are only one of the many safety features which help to make this new and modern mill an outstanding example of what management can do towards providing safe and clean conditions for its employees.

After the reel the rolls are then lifted to a Cameron winder where the sheet is slit and tightly wound to specified widths and diameters for shipment to National's several gypsum plants for conversion to laminated paper and gypsum wallboard.

Centrifugal Pumps

Part 20 of a series

Selection of electric motors for centrifugal pump drive

IGOR J. KARASSIK and ROY CARTER
Application Engineers
Worthington Corporation*

IN THE SELECTION of all drivers for centrifugal pumps sound judgment must be exercised to insure that a suitable and proper driver will be employed to make the unit satisfactory. When the drive is to be a steam turbine or an internal combustion engine, full details of the requirements are usually given the manufacturer of the driver. With electric motors, however, less care is exercised, with the result that motors of more or less unsuitable electrical or mechanical construction are often used. This mis-application is, no doubt, mainly due to the fact that the so-called general purpose motors are offered by the various motor manufacturers for ratings of 200 hp or less and 450 rpm or more without restriction to a particular application. It is therefore of importance that the user realize the requirements of the application to make certain that the proper motor is employed.

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.

*Formerly Worthington Pump & Machinery Corp.

Electrical systems

There are two basic types of electric power supply, direct current and alternating current.

In direct current, the flow of electricity is in one direction and the power in kilowatts is volts x amperes/1000. Direct current systems have certain limitations and disadvantages which have limited their use, and most power systems are for alternating current.

In alternating current systems the flow of current reverses or alternates. The voltage and the current vary in amount and direction with time. The current and voltage can reach their maximum at the same time, or the peak of the current can be ahead of or behind the peak of the voltage. The measure of this is called power-factor. It can range from 0.0 to 1.0 or 0.0 to 100 per cent. The power in kilowatts is volts x amperes x power-factor x K/1000, where K is 1.0 for single phase systems, 2.0 for two-phase four-wire systems and 1.732 for three-phase systems.

A cycle in alternating current is the change occurring from the peak of current flowing in one direction to zero to the peak in the opposite direction to zero to the peak again in the first direction. The number of cycles occurring per second is the frequency. In the United States a number of different frequencies exist, but 60 cycle current has gradually become almost universal although there are still some 25 cycle and 50 cycle systems in the United States and also isolated installations of 30, 40 and other cycles.

Alternating current systems are also classified as to the number of phases. Single, two and three phase systems are encountered, most being either single or three phase. Two and three phase systems are known as polyphase systems.

The table herewith indicates the voltages that are considered more or less standard for alternating current systems, with those normally used shown in italic type. Those less frequently encountered are shown in roman type. This table also lists the normal range in motor sizes that can be obtained with these voltages.

With alternating current, the speed of the motor is a function of the number of cycles of the supply and the number of poles, which is always an even number as the poles must be in pairs. The synchronous speed of a motor in rpm is 120 x frequency / number of poles.

Direct current motors

There are three types of direct current motors: shunt wound, series wound, and compound wound. The commercial stabilized shunt wound direct current motor has some compound windings. The general purpose type of direct current motor is not suitable for centrifugal pump drive as the full load speed of such motors may be 5 to 7½ per cent above or below their rated speeds. If the actual speed of the motor is below rated, the pump will not produce its rated conditions, while if the actual speed of the motor is above its rated speed the pump will deliver

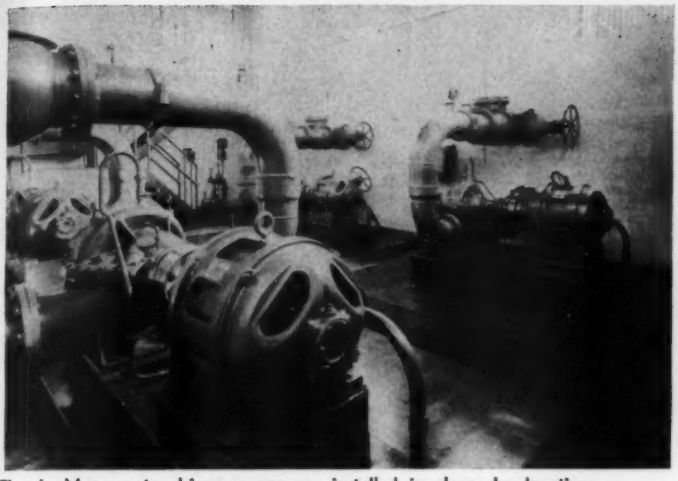


Fig. 1—Many motor-driven pumps are installed in clean dry locations, where open motors can be used

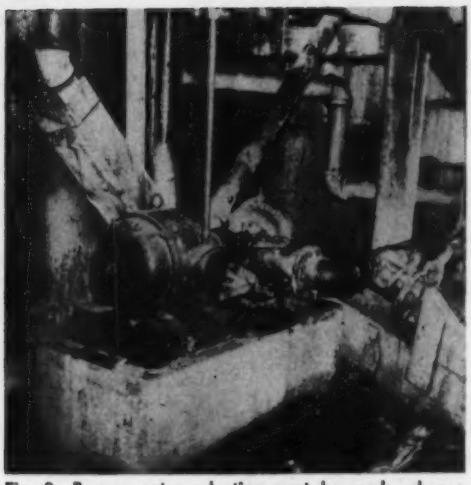


Fig. 2—Proper motor selection must be made when a unit is subjected to dripping liquids, dampness, dirt

excess head or capacity with increased power requirements possibly imposing a dangerous overload on the motor. For centrifugal pump drive, dc motors must be specifically ordered, and a design is furnished by the motor manufacturer which will have a hot full load speed within 3 per cent plus or minus of the rated full load speed.

The speed of regular shunt wound direct current motors can be increased above its basic speed by the use of a field rheostat with little change in efficiency. The motor speed can be reduced below its basic speed by introducing resistance in the armature circuit. This latter method of speed control has a considerable loss.

Single phase motors

Single phase alternating current motors are available in the split phase, series (universal), repulsion, repulsion-induction, and capacitor types. Generally, for centrifugal pump drive, either the repulsion-induction or capacitor type is used.

Polyphase motors

Polyphase alternating current motors are usually of the squirrel cage, the wound rotor (or slip ring), or the synchronous type. A fourth type called the brush shifting type is quite common in Europe. A commercial U.S. design has recently been offered in limited ratings.

Squirrel cage motor

The squirrel cage motor is the simplest type of electric motor and is the most commonly used for centrifugal pump drive. It has a wound primary (stator) winding and a squirrel cage secondary (rotor) winding which takes power from the primary winding by transformer action. No electrical connection to the rotor is required. Mechanical construction permitting, a squirrel cage motor can be run in either direction and is reversed by reversing any two leads of a three-phase or the two leads of one-phase or a two-phase motor.

Squirrel cage motors are made in a number of types electrically. The common types are:

(1) Normal torque, normal starting current (NEMA Class A).

(2) Normal torque, low starting current (NEMA Class B).

(3) High starting torque, low starting current (NEMA Class C).

(4) High starting torque, high slip (NEMA Class D).

In addition, there are two special types, (a) low torque, normal starting current, and (b) low torque, low starting current. Besides single speed motors, multi-speed motors (5) are commercially made.

No centrifugal pump requires the use of a motor having a high starting torque, so types (3) and (4) do not find a field of application for centrifugal pump drive. Multi-speed motors, type (5), are made in two types. In one type the stator winding is so wound that by external switching the number of poles can be changed. Thus a 6-pole (1200 Rpm-60 cycle) motor can be made so the winding can be reconnected by external switches so it becomes a 12-pole (600 Rpm-60 cycle) motor. The mechanical and electrical problems only permit obtaining certain combinations of poles, so the choice of speeds available for pole-changing motors is very limited. Commercial listed single winding motors are limited to motors where lower speeds are half the higher speeds, such as 3600 and 1800 rpm, 1800 and 900 rpm, 1200 and 600 rpm and similar combinations.

In addition to the single winding type of multi-speed motors, a second type of multi-speed motor is available in which two separate stator windings wound for a different number of poles are used. With one set of windings, one speed results while, when the other set is used,

Supply	*Voltage*	*Reasonable Motor Sizes* *Minimum*	*Maximum*
Direct Current	*115*	—	30 HP
	230	—	200 HP
	550-600	½ HP	—
Single Phase A.C.	110-*115*-120	—	1½ HP
	220-*230*-240	—	10 HP
	460-550	5	10 HP
2 or 3 Phase A.C.	110-*115*-120	—	15
	208-220-230-240	—	200
	440-550	—	500
	2300	40	—
	4000-*4160*	75	—
	6000-*6600*	400	—

Where no minimum is given, very small fractional hp motors are feasible. Where no maximum is indicated, very large motors exceeding normal commercial sizes are possible.

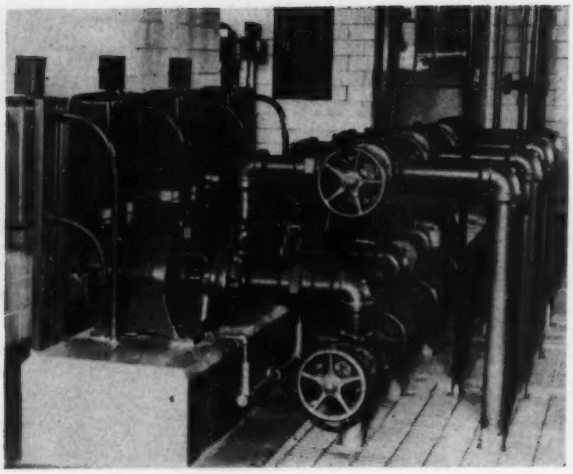


Fig. 3—Motor mounted pumps are now popular in small sizes

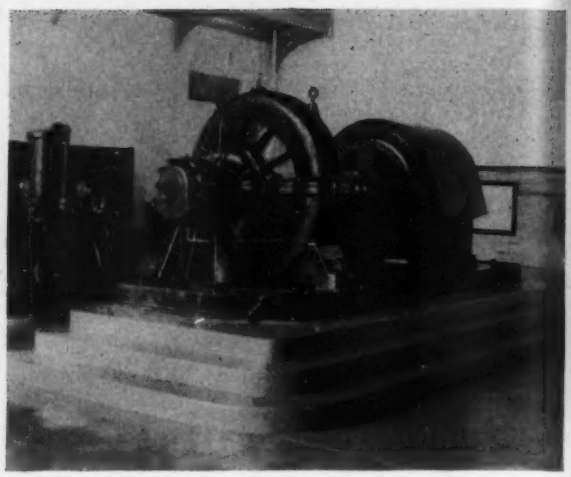


Fig. 4—Motor-driven centrifugal pumps are predominant in water works

the motor runs at the other speed. It is in addition feasible to build the motor so the number of poles in one or both windings can be changed, thus obtaining three- or four-speed motors, for example a 1800/1200/900/600 Rpm motor.

Multi-speed motors are offered in the constant horsepower type and in both the constant torque and tapered torque types. As the power in a centrifugal pump varies as the cube of the speed, the torque will vary as the square of the speed, so the tapered torque type of multi-speed motor is suitable for centrifugal pump drive.

There is little application for centrifugal pump drive for three- and four-speed motors, as the spread in speed is wide for these motors and the resulting capacity and head at reduced speed is very low. Very occasionally they find application for centrifugal pump drive when the unit is being used on a circulating system in which the head is entirely frictional. In systems having a small static head component it is sometimes feasible to utilize a drive involving three or four available speeds and accomplish this by using two single or two-winding, two-speed motors coupled together or on either end of the pump.

For most centrifugal pump applications, constant speed motors are used.

The normal torque squirrel cage motors, both of the normal and low starting current types, are the types most commonly used. These are the general purpose types in the open frame horizontal designs. The normal torque, low starting current type was formerly used primarily when full voltage starting was employed and was more expensive than the normal torque, normal starting current type. This price differential no longer exists and the motor manufacturers are discontinuing the normal torque, normal starting current type, making their standard the normal torque, low starting current type.

Slip ring motor

The slip ring or wound rotor motor has both a wound primary and secondary winding. The primary or stator winding is the same as that of a squirrel cage motor. The secondary or rotor windings are connected to slip rings so, for starting or speed regulating purpose, resistance can be introduced in the secondary winding, thus reducing the flow of current and also affecting the torque-speed characteristics of the motor. The major field of application of slip ring motors is for installations where variable speed is necessary. The resistors used for speed control must dissipate the heat resulting from the flow of current through them. The commercial form of speed control cuts the resistance into the rotor curcuit in steps so the resulting speed change is also in steps. Thus, when fine adjustment of speed is necessary, it is necessary to obtain a control with a large number of contact points or to use a liquid slip regulator. Where very fine adjustment of speed is required, the hydraulic and magnetic drives are finding more applications.

One of the major advantages of the slip-ring motor lies in its starting characteristics. With proper resistance in the rotor circuit, the current demand throughout the entire starting period can be kept very low; for example, on starting this type of motor, it can deliver rated torque with no over rated current from the line. This feature makes this motor very desirable if it is to be operated on a limited power supply or if the size of the supply line is limited.

Synchronous motors

The usual construction of synchronous motors consists of a wound stator connected to the alternating current supply, and a rotor with wound poles connected to a direct current circuit, which is obtained either from a separate source of supply or from a direct current generator, called an exciter, which may be attached to the end of the motor. This type of motor runs at its synchronous speed irrespective of the load, hence, its name. In its basic form, this type of motor has a very low starting torque characteristic so the modern commercial version has an auxiliary squirrel cage winding built into the rotor for starting duty. This motor is therefore started as a squirrel cage motor, and when the speed has reached approximately 95 per cent of rated, the field (rotor) current can be applied when the position of the rotor properly matches the alternating current flow in the stator. This is called synchronizing. With present day automatic control, this application of field current can be done at the proper instant and thus the starting of a synchronous motor has been greatly simplified.

As a synchronous motor is started by use of its auxiliary winding as a squirrel cage motor, the starting torque and starting current characteristics depend basically on the squirrel cage motor element. While it is feasible for the motor manufacturer to provide a design in the squirrel cage element with characteristics as in the regular types of squirrel cage motors, the space limitations in the rotor for the squirrel cage element as well as other factors impose some limitations on the design of squirrel cage motors that can be incorporated in a given synchronous motor design.

For relatively large synchronous motors, part winding motors are obtainable. This type of motor has the alternating current stator winding made of several parallel windings. In the starting cycle of this type the current is applied to one group of windings and the initial inrush of current is in the magnitude of a motor of a smaller size. Then as the motor reaches part speed, the second group of windings is cut in to carry it up to the synchronizing speed.

process steam is not sufficient to make a non-condensing extraction turbine in-

Electric motor vs small steam turbine paper machine drives

equipment being purhased on well considered detailed specifications. For ex-

Boiler firing front at power plant of River Raisin Paper Co., Monroe, Mich.

Paper mill power plant improvements

A. A. CUMMINS
Cummins & Barnard Inc.

The men responsible for the successful operation of paper mills are bound to ask themselves at intervals whether or not their electric power and steam costs are as low as they might be reasonably expected to be. Any extended consideration of that question should be based upon a complete engineering survey, analysis, and report which takes into account the probable limits of operation over a period of years, the amounts of steam and electric power required, and the pressures at which the steam will be used. This establishes a base on which power plant improvements can be quite accurately made in sequence extending over a considerable period of time and in such a way that when the program is finished its development will have been logical and the results highly satisfactory.

Many industrial power plants have been built without adequate study to insure best design and highest economy of operation. If there were a fuller realization of the magnitude of the financial returns resulting directly from the engineering work involved and included in a complete survey, analysis, and report, there would be more topnotch industrial plants.

Survey, Analysis, and Report

If a considerable amount of the plant requirements for electric power in a paper mill are either purchased or generated by a condensing turbine-generator, a study and survey is in order to determine if power costs cannot be substantially reduced by changes in operating pressure and temperature and in generating and other equipment. Some mills that are now using condensing turbines or purchasing electric power could profitably change over to more efficient operation.

Data needed

Complete data should be secured on existing operations, including that which can be obtained from the regularly kept records, as well as additional data needed for a complete report and which should be obtained by direct measurement as a part of the survey. For a paper mill, data should include:

1. A description of the principal equipment.
2. Paper produced, steam required, total electric power used, and fuel burned by years, months and days, with consideration given to maximum and minimum quantities, the btu content of the fuel, and kinds of paper made.
3. Steam distribution for initial use, such as in turbines, engines, digesters.
4. Steam distribution and btu purchased per pound of paper made for each part of the operation, such as paper drying, heat equivalent for mechanical power, heat in condensing water wasted to the sewer, digesters, heating water for process uses, building heating, boiler room losses, etc.
5. Determination of recoverable losses in transmission and use.
6. Engine indicator cards to secure an over-all power picture.
7. Electric load and its distribution.
8. Expected increases in steam and power uses.
9. Estimate of power required based on complete electrification, if that is eventually considered, including changes in power requirements the new power plant installation or modifications would make.

Spread of operation

Consideration of the spread of operation should take in possible changes in the amount and kinds of paper made, together with the varying requirements for steam and electric power so that computations can be made to show how successful, from the viewpoint of operation and economy, the proposed new power plant installation or modifications will be over a wide range of possible operating combinations. An installation cannot be made to work perfectly for all conditions of operation, but limits can be set as to the amount of paper to be made, steam and power to be used, and other factors between which the operation will be highly satisfactory and through which range the economy of its operation can be predicted.

Correct pressure and temperature

A large number of paper mills have installed boilers to operate at pressures between 500 and 750 psi with temperatures between 600F and 780F. If the economies of the operation justify it, there is no reason why pressures and temperatures higher than these should not be used.

Different conditions exist at each mill, and the steam pressure and temperature to use for a boiler and turbine installation need to be determined for that particular plant based on its existing operation and on what is planned for the future.

There are times when steam required for processing, which can be extracted and exhausted from a turbine, is sufficient to generate all the electric power for practically all the time, so that a non-condensing extraction unit becomes the most economical. Ordinarily, the smallest requirement for process and heating occurs in the summertime, when no steam is required for building heating, and when less steam is required for water heating.

The pressure and temperature at which the equipment is to operate should be chosen so as to produce, non-condensing if reasonably possible, the required electric power based on summer demand for process steam. This means that during the winter more process and heating steam will be required than is needed to generate the electric power, and this excess steam would be obtained through a reducing valve. It should be noted that throttling does not change the enthalpy of the steam. Therefore, the full heat energy originally supplied to the steam in the boiler is useable for process work, when this steam is taken through a reducing valve.

In some paper mills, the demand for

process steam is not sufficient to make a non-condensing extraction turbine installation the most economical. For these plants a condensing turbine with single or double extraction may prove to be the best. Double extraction turbines become applicable where process steam is used at two different pressures. Uncontrolled extraction points may also at times be used for economical feedwater heating or for maintaining boiler exit gas temperatures above the dew-point at low loads.

With a non-condensing extraction installation, when the electric load is such that more steam is required for power generation than can be used for processing, the excess steam is exhausted to the atmosphere. This may occur for short periods of time when starting up or when there is no paper on the machine. With such losses limited, a non-condensing installation may still remain the most economical. However, such amounts that are likely to be wasted in this manner should be balanced against the losses which would occur from operating a condensing extraction machine, since with the latter installation a certain amount of steam must always pass through the last blades to the condenser even though make-up steam is being taken through a reducing valve for processing. Also, with the condensing unit additional power must be furnished for operating the circulating water and condensate pumps.

Fuels and fuel burning equipment

Generally speaking, the fuel burning equipment installed should be that which will give the lowest priced steam. Gas and oil have many advantages over coal as a fuel, but, in many localities their higher cost prohibits their use. Where they can be used economically, convenient and efficient installations can be planned. In the case of coal, low-cost steam may result from high efficiency of boiler operation, from the ability to burn low-grade coals which can be purchased at a lower cost per 1,000,000 btu than can the high-grade coals, or from a combination of the two.

For boilers of up to at least 200,000 pounds of steam per hour, serious consideration should be given to the installation of a spreader type stoker with a moving grate. These stokers, when properly designed, are able to burn almost any grade of coal available. During strikes this is a very important advantage. It is a distinct advantage in the purchase of coal since it permits the use of low-priced coals which may be available at certain times, and also the use of coals which cannot be burned as well with other types of fuel burning equipment and which can therefore be purchased at lower cost. This all results in a lower steam cost.

Electric motor vs small steam turbine paper machine drives

Small steam turbines make a very convenient drive for paper machines and are less expensive to install than electric drives. The steam required by a small turbine, however, if put through a large efficient high pressure and temperature turbine will generate more than enough electric power to operate the equivalent drives and in that way improves the heat balance. In some instances, it may also eliminate the need for an extra steam engineer.

Heat recovery equipment

Quite often heat can be recovered from hot waste liquids such as from digester liquor. Such recovery reduces the amount of steam required from the boiler house and should be considered in connection with any power plant improvements.

Installation or Modification

To secure the results predicted in the engineer's report, it is important that the recommended installation or modifications be carried out in accordance with complete specifications, detailed studies and plans, and adequate professional supervision. In no other way is the owner likely to fully realize the results promised in the report.

Specifications

It can be easily shown by proposals received that where the specifications are not complete as to what is to be furnished by the vendor, there will be a wide variation in quality, physical dimensions and real capacities of the equipment set forth in the different proposals. Without complete specifications and information, the owner may be tempted to buy the equipment which has been offered at the lowest price with the result that often he does not get a satisfactory installation.

While the equipment manufacturers are most certainly likely to know more about the design and manufacture of their particular equipment than the engineer, the engineer should and is likely to know more about the over-all problem with which he is confronted. Therefore, given the performance data which is available from the different proposals for different sizes and for different conditions of steam, pressure, temperature, and other phazes of the operation, the engineer is best qualified to work out an over-all installation which will have the highest efficiency and ease of operation. For that reason, the final technical decisions on equipment should be made by the owner's engineers.

In the purchase of major items of equipment, the engineer's services should be utilized to the fullest extent, with equipment being purhased on well considered detailed specifications. For example, if the matter of specifications for a boiler is left to the discretion of various boiler manufacturers, with only the amount of steam required per hour, the pressure and temperature, and the fuel to be burned stipulated, the owner will receive quotations with extreme variations not only in price, but also in amount of heating surface, burning equipment, furnace volume, fan capacity, setting construction, and total weight; and as a result, wide variations in inherent flexibility, ability to handle load swings, efficiencies, and other very basic considerations.

Plans

Detailed plans which show the complete design and layout of the proposed installation or modifications, along with competent supervision, assure correct construction, proper materials, and lower cost because they make it possible for the contractors bidding on the work to know exactly what is expected.

Instrumentation and operating records

A further consideration which makes for success of the installation of new power plant equipment is instrumentation and opearting records. Sufficient recording and integrating instruments, which show the amount of coal burned, steam produced, temperatures, pressures, etc., should be installed so that accurate records may be kept of the operation. These will give the supervising engineer and management the information they need to know as to whether expected results are being obtained, and where corrections, if necessary, can be made to improve operating efficiency. These records should be complete and each month a summary made up showing the most important figures.

Also, samples of coal accurately taken several times each shift should be kept to furnish a composite sample at the end of the month of the coal burned during that period. Tests of the composite monthly coal sample, together with steam records, will give an over-all average efficiency of the month which, considered for the various months, will be valuable in maintaining efficient operation.

Summary

To state the above points briefly, the owner who is considering power plant improvements will serve his own interests best if: (1) He has a complete survey, study, and report made showing the possibilities, and (2) in case he decides to proceed, he does so on the basis of complete plans and specifications and the best of supervision.

Fig. 1—Variable speed drive as applied to feeding cooked chips to the refiner

Fig. 2—Regulating pump speed on a calcium carbonate tank at a kraft mill

Paper mill efficiency results from . . .

Stepless speed control of machinery

FRANCIS A. WESTBROOK

THE ADVANTAGES OF stepless speed control of various operations in the paper industry has led to numerous variable speed drive applications which are quite likely to result in many extensions of this up-to-date practice.

An interesting example is that of the plant of a paperboard manufacturer that makes its own pulp. In this plant a screw feeder delivering cooked chips to a refiner is driven through a Stephens-Adamson JFS variable speed unit as shown in Fig. 1. By means of speed control it is possible to vary the feed to anything between 100 and 300 cu. ft. of chips per hour according to the conditions. As the latter may call for small or large adjustments from time to time, stepless control is very convenient and makes for a degree of efficiency otherwise not practicable. The control wheel is on the end of the variable speed unit next to the motor, and in this installation it has a sprocket and chain for remote control.

The use of a separate variable speed drive for the dandy roll has been found to give better control of sheet formation and more distinct watermarks where the finer grades of paper are being made. This is known as the Sandy Hill-Spencer dandy roll drive and has been developed by the Sandy Hill Iron and Brass Works. A 1½ hp motorized gear variable speed changer (Link-Belt P.I.V.) is used to make possible the different speeds required for different sizes of dandies. Speed changes are made easily and accurately by merely turning the handwheel.

In addition, the drive includes electronic control to synchronize the dandy roll drive motor with that of the fourdrinier wire so as to follow any erratic speed variations occurring in the mill power system from its power source.

High torque for safety

The output shaft of the variable speed unit is connected with a worm gear speed reducer through a flexible roller chain coupling, and the output shaft of the reducer has a high torque inner driving element giving the effect of free wheeling. This is a safety measure in case of electrical trouble and permits the dandy roll to revolve in the old way through contact with the fourdrinier wire. For bond, stationery or other fine grades of paper the output side of the reducer is connected with the dandy by silent chain, which does not slip and gives very smooth operation. For cigarette paper successful results have been obtained by connecting the output side of the reducer to the dandy roll by a flexible shaft and supporting the dandy in a spring cradle, which permits it to oscillate with the fourdrinier wire.

Fig. 2 shows a motor-driven pump for a calcium carbonate tank at a kraft mill with a variable speed control unit. Speed adjustments can be made while the pump is in operation by turning the handwheel, the dial indicating the speed setting. This arrangement provides for accurate and quick changes in the pumping speed and makes for efficiency and close control of quality.

Speed control of cutter drives on paper machines is of course necessary in some form when the sizes of the sheets cut are not always the same. An accurate method of controlling the speed of the cutter drive is seen in Fig. 3, where the variable speed unit is equipped with a semi-automatic tensioner and remote electrical control.

Variable speed drives for tubers

Tubers used for making paper bags may be equipped with variable speed drives whereby the speed of operation is changed in small amounts for the manufacture of bags of different lengths. Unless an accurately controlled variable speed drive is employed, it is necessary to have on hand numerous change-gears to make bags of different sizes. This entails a considerable investment, plus handling, upkeep and replacement costs and loss of time in making the changes. The modern variable speed drive of course does away with all this, and when the speed for a given size is once set it remains constant until the setting is changed.

Bottoming machines which fold and paste the bottoms of the bags are also sometimes equipped with variable speed drives to handle various sizes with a minimum of effort and cost. One of these drives is shown in Fig. 4.

A Potdevin paper sack machine is shown in Fig. 5. In this case the variable speed feature is obtained by means

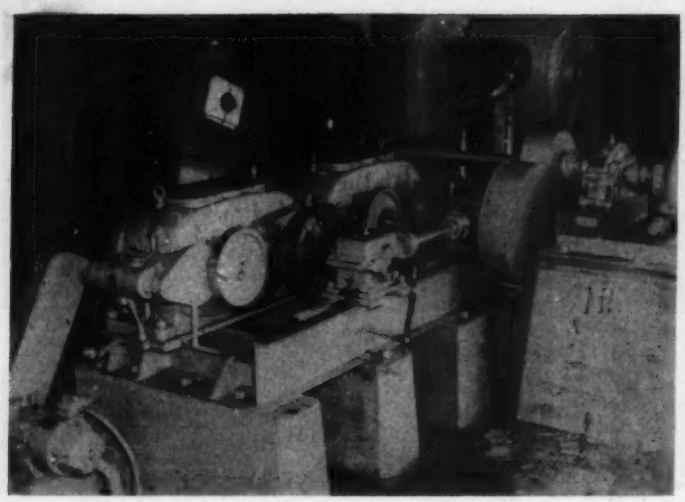


Fig. 3—Obtaining precision control of a paper machine cutter drive

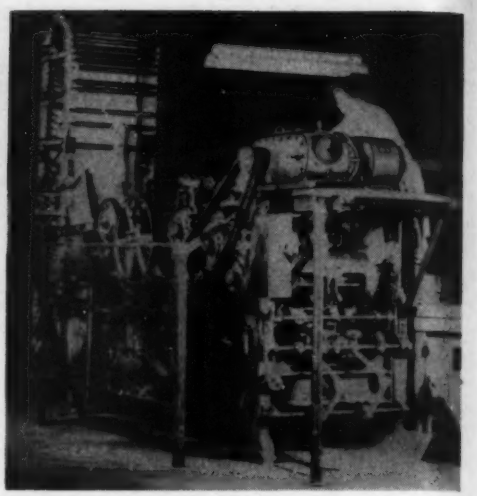


Fig. 4—Bottoming machine with variable speed drive application

of a Reeves Vari-Speed motor pulley which is adjusted for speed changes by means of the handwheel. These machines are used for making large paper sacks of kraft with chip-board bottoms for use as shipping containers for empty cans and paper milk cartons. As the bags vary in size it is necessary to change the speed of the machine from time to time for different runs, and the variable speed motor pulley furnishes a convenient means for making such changes accurately and without loss of time.

The rotary high speed slotting, scoring and slitting machine for making corrugated paper box blanks shown in Fig. 6 also has a Reeves variable speed transmission. This machine has been designed by its manufacturer, Progressive Corrugated Paper Machinery Co., to handle blanks from 9 to 60 in. wide and a minimum of 14 in. long and with a set-up mechanism for a wide variety of blanks that permit making set-ups with accuracy in three minutes. The variable speed transmission is driven by a 7½ hp constant speed motor and is provided with an extended handwheel control so that the speed may be quickly and accurately changed as called for by the size of the blank being processed. In other words, the variable speed feature of the drive is an essential part of the machine without which its versatility would be greatly limited, and it is standard equipment on these machines.

Automatic taping machines

The same company makes an automatic taping machine for taping corrugated containers, the drive for which has a variable speed transmission. This controls the speed of the conveyor that delivers the containers to the machine, which must be varied according to the size and type of a given run of boxes. The speed of the taping mechanism, which is geared to the output shaft of the transmission, is also changed. In this way maximum output, consistent with good quality, is secured. If the operator is inexperienced it may be run more slowly until he becomes used to it.

More examples could be given as to where variable speed drives have been used to increase the efficiency and versatility of paper machinery, but enough have been presented to show what can be done. There are many other possibilities that an alert plant engineer will doubtless be led to by careful consideration of the accomplishments referred to. Of course, the variable speed units can usually be inserted in a drive without difficulty and at reasonable cost, especially when the production and versatility of a given machine is thereby increased.

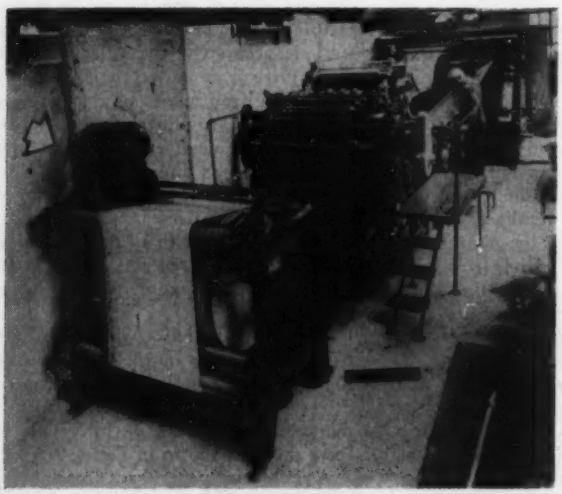


Fig. 5—Vari-Speed motor pulley being used on a paper sack machine

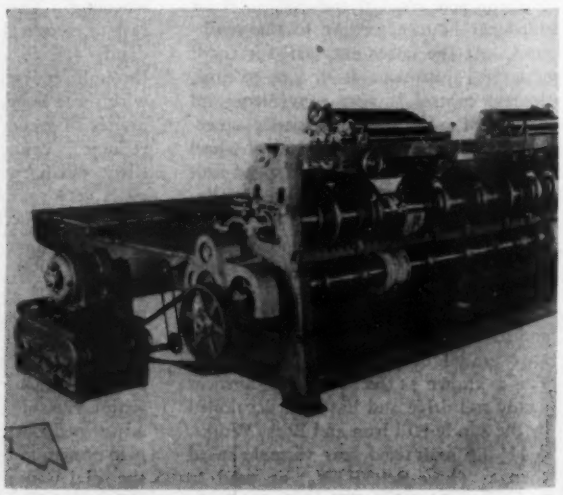
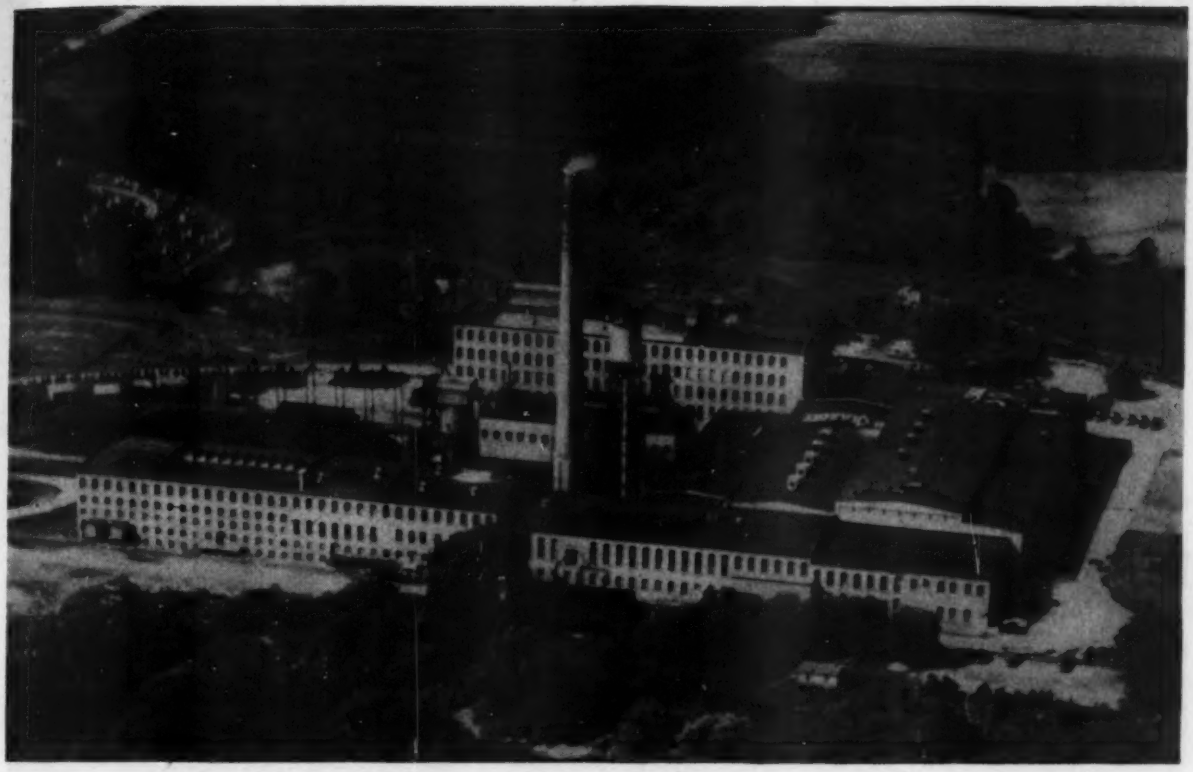


Fig. 6—Accuracy and speed obtained with application on a slotting, scoring, and slitting machine



Air view of Lee Paper Co. at Vicksburg, Michigan

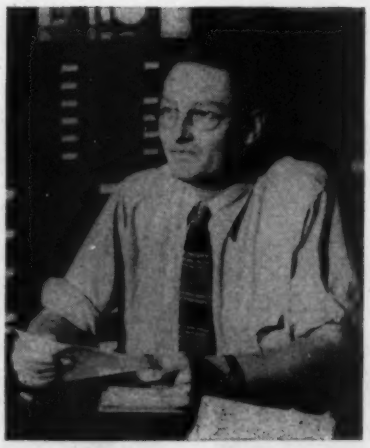
Production doubled as . . .

Lee Paper adds new machine

A. W. J. DYCK, Ph. D.
Consulting Editor

The new Beloit paper machine which has been in operation at Lee Paper Co.'s Vicksburg, Mich., plant since last August is still big news. It is news because it is the first new fourdrinier paper machine installed for the manufacture of rag content papers in the United States during the last 20 years. The machine, a model of compactness and efficiency, has gradually been integrated with the company's over-all production effort and today turns out some 40 daily tons of technical and commercial grades of fine papers.

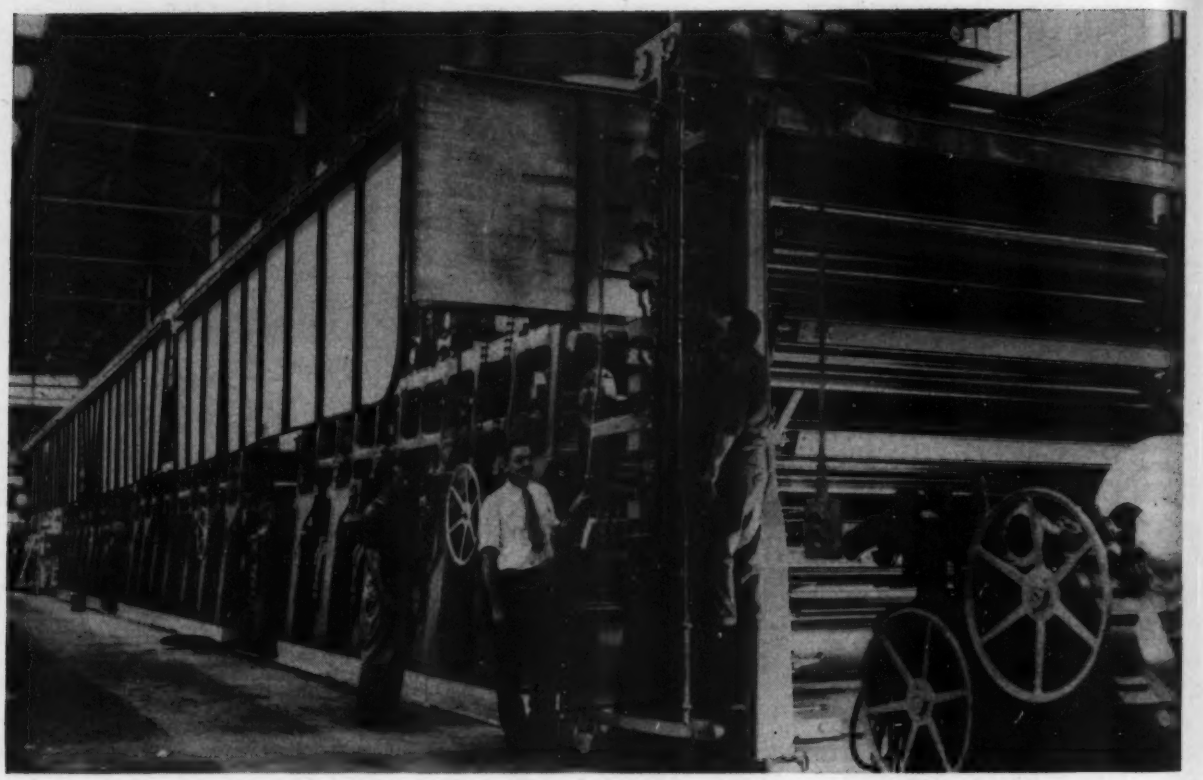
The company manufactures several items which fall under the category of "technical" paper. Leading grades in this line are blueprint, direct process types, photographic and drawing. In addition, there is a wide range of bonds, ledgers, bristols and vellums. In Lee's secondary processing are produced many specialties in embossed papers and pasted stock.



Maxwell D. Bardeen
President and General Manager

The machine has a 132-inch screen and delivers a 118-inch sheet of business printing and reproduction paper. It operates at approximately 450 feet per minute. With the other two machines, Lee now produces about 80 tons of paper per day.

The new machine is still big news because its installation has led to drastic changes in plant operation and company organization. It has forced the company to seek a new balance in the light of its vastly increased production capacity. It is one thing to install a new machine, it is quite another to adjust plant operations to a sudden 100 per cent increase



Dry end of fourdrinier, with President Maxwell Bardeen (center) inspecting the installation

in production facilities. In the words of Maxwell Bardeen, president and general manager of Lee: "It was no problem to figure out how many men it would take to run the machine itself, but, beyond that, few of us visualized the full impact the new machine would have on the whole organization."

New plant program

Accordingly, a program is now underway of streamlining, reorganizing and coordinating that does not miss a single aspect of the company's activities. This program, when completed, will give the company the scope, depth and strength of organization which will keep it on the crest of modern developments.

The integration of the new machine with over-all plant operations constituted, above all, a substantial engineering task which has been adequately handled by the Lee staff. After having been through the greater phase of the readjustment task, they all admit that the problems which presented themselves were legion, many of them not anticipated.

Among the first requirements that came with expanded production facilities was the need of more maintenance personnel. With this in view, selections were made among plant employees and a training program initiated in the mechanical and electrical departments. This program of on-the-spot training was supplemented by enrolling suitable employees in a training course given by one of the leading correspondence schools.

The finishing department has increased the number of its employees from 46 to 67. Two new cutters and a new rewinder were added to the equipment in the finishing room to meet the increased output from the new No. 3 paper machine. A new approach to fanning, counting and trimming is being introduced in this department. Lee Paper, while not the first to use the "line production" method in these operations, has incorporated some refinements, tailored to their needs.

The company has a modern laboratory which is built around the necessity for

Ralph Atkins
Superintendent

Gordon Moore
Plant Engineer

R. L. Hussey
Chief Power Engineer

William Penar
Machine Tender

Differential mechanical drive on back side of the machine; note lineshaft set 16 inches off the floor

Reverse unit size press from front side of new 130-inch machine; 20-inch top roll has ebonite surface while 24-inch bottom roll is rubber-covered

thoroughly testing its specialty papers as well as the research required to keep abreast of the constantly changing picture in the technical paper division. The firm is planning upon enlarging this department even further to make space for more testing equipment. Other plans call for new air-drying facilities, a new pasting machine and expansion in the rag fiber processing equipment.

Mr. Bardeen, in a simple understatement, stated that Lee's two machines could not make enough paper to satisfy its customers, so it was decided to build a new machine room and install a paper machine. Actually, the installation of No. 3 paper machine is only one phase of a long expansion program which started back in 1936. Mr. Bardeen further states that the project is probably about half way toward the goal.

Tailor-made for Lee

The new machine was tailor-made to meet the requirements of a progressive organization. The approach to its design and building was quite ideal. Beloit Iron Works engineers and designers drew up tentative plans for the machine. They then came to Vicksburg and in meetings which included the engineering and production staffs of Lee they worked over the features wanted in the machine. In subsequent meetings the machine room building contractor "sat in" so that necessary special features of the machine room could be "built in." In this manner the pattern was laid which enabled Beloit to build a machine which today ranks among the first of its kind in the paper industry and is as near to a push-button control model as is practically possible.

Differential mechanical drive

The machine incorporates many unusual features. One of the most significant of these is the Beloit differential mechanical drive. This is especially so when you compare it with the conventional drive made up of line shafting, belts, cone pulleys and gears. Upon first seeing the differential drive you are struck by the fact that nowhere are there any belts or gears to be seen. Sighting down the back side of the machine you are only aware of a lineshaft, close to the floor (16 inches) intermittently interrupted by smoothly designed housed gear units with an inshaft going into one of the machine sections. These units are the Beloit drive in combination with Link-Belt P.I.V. variable speed drives. There are 10 of these units supplying power to as many sections. Based upon experience thus far, they appear to give the machine perfect draw control.

A Bowser lubrication system circulates filtered oil through an enclosed pipeline to all lubrication areas. Other interesting features are the telescoping hoods,

Looking toward wet end of 130-inch paper machine recently installed at Lee Paper Co.

operated by air-pressure, which provide unobstructed passage to the overhead crane.

Stock preparation

Paper stock for No. 3 machine is prepared in the new beater room which adjoins the old beater room. The stock lines of these two rooms are inter-connected to make operations and paper stock batches interchangeable and available for processing on any of the three machines. The new beater room houses two white tile-lined Jones-Bertram beaters, each of 1,000 pounds capacity; two tile-lined breaker beaters, each of 1,000 pounds capacity; one tile-lined Jones Pulpmaster of 2,000 pounds capacity; one stainless steel lined Jones Pulpmaster of 1,000 pounds capacity; two Morden Stockmakers, and two Jones Imperial jordans equipped with stainless steel tackle.

Wood pulp stock in 2,000 pound batches is prepared in the Jones Pulpmaster in less than 20 minutes. Baled pulp, broke, clay, sizing, and dye are fed into the Pulpmaster and thoroughly mixed with water to a consistency of 3½ per cent. Rag stock is prepared in the Bertram beaters, and broke handled in the breaker beaters. Difficult wet-strength stock, map and blueprint broke are broken down in the 1,000 pound capacity Pulpmaster.

The stock from the Pulpmasters and beaters is blended in the desired proportions in the Chemtile-lined beater chest of 4,000 pound stock capacity. It is then passed through the Morden Stockmakers and the jordans for further refining, and then to the machine chest, which has a capacity of 2,000 pounds.

From the machine chest the stock is pumped into a header supplying a battery of seven Bird Dirtecs. From the Dirtecs the stock goes to a consistency regulator, then through leads to and through a pair of specially designed E. D. Jones & Sons rotary drum screens. All along this stock route precautions have been taken to eliminate turbulence, eddying and pockets. The stock, now of about 1 per cent consistency, passes through the headbox (Beloit designed) equipped with two rubber covered rectifier rolls and double adjustable slice.

Beloit machine in operation

The stock mixture passes smoothly and without turbulence from the headbox to the fourdrinier wire which is 130 inches wide and 75 feet long. An adjustable Beloit high speed super-shake installation gives the wire the necessary oscillation.

Beams, cross ties and shafts of the fourdrinier are all stainless steel, while the wire pit and couch pit are tile-lined. A stainless steel saveall is mounted on a mezzanine in such a way as not to interfere with wire changing. The fourdrinier has six oscillating lattice-type suction boxes and a 26-inch diameter Beloit suction couch.

From the dandy roll (a 16-inch motor-driven unit) the sheet crosses into the press section which consists of two plain presses. The press rolls are mounted in heavy duty anti-friction bearings which are interchangeable. The top rolls are 23 inches in diameter with a Microrok covering. The 24-inch bottom rolls are covered with rubber. Both the Microrok and the rubber covering were done by Stowe-Woodward.

All felt rolls are rubber-covered, and the press felts are guided automatically by Beloit-patented air-guides.

The drying operation is carried out in three drying sections made up of 14, 14, and nine dryers respectively. Three additional dryers are used for felt drying. All dryers are 48 inches in diameter and operate under 20 pounds steam pressure. The bottom roll in the first section and three rolls in the third section have a stainless steel surface.

The second and third dryer sections are separated by a reverse unit size press. Its 20-inch top roll has an ebonite surface and the 24-inch bottom roll is rubber-covered. The paper sheet is immersed in the sizing material before it passes through the size press.

From the dryer the paper sheet passes through an eight-roll Beloit calender stack and then to a Pope-type Beloit constant speed transfer reel.

A total of 12 men, consisting of three machine tenders, three backtenders, three third hands and three fourth hands keep the machine on its regular schedule.

Fibreboard's higher steam pressures show . . .

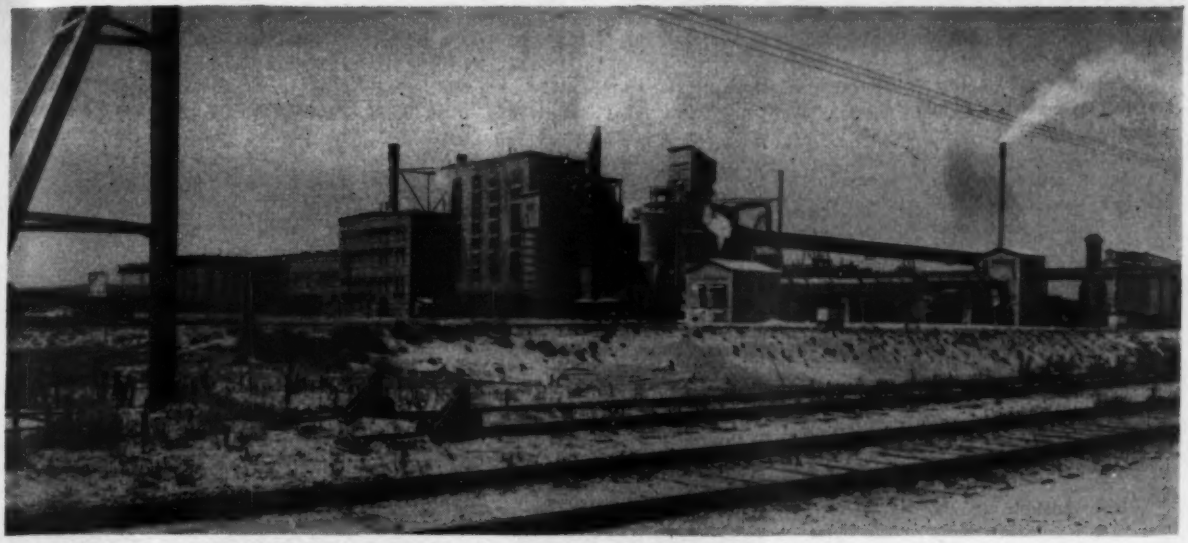
Importance of heat insulation

H. P. HANSELL
Plant Asbestos Co.

Some 20 years ago paper mill steam plants operating at 400-450 psi were considered high pressure installations. Today, many mills are installing 500-650 psi plants and in some cases 900 psi plants. This trend is due to the fact that operations in a modern mill are more efficient and economical at the higher steam pressures. For example, increased paper machine drying roll pressure and temperature increases paper production with a relatively small increase in investment.

To get maximum benefit from these new operating conditions, well-designed insulation must be provided for all heated equipment. So much heat can be lost from uninsulated or inadequately insulated equipment as to cancel out some of the savings attained with the higher operating pressures. Insulation also helps plant working conditions by preventing the workroom air from becoming overheated and by protecting workers from being burned by exposed hot surfaces.

In the new kraft board and paper mill of Fibreboard Products, Inc., at East Antioch, Cal., the insulation design was integrated with the over-all plant design and engineering. Where operating temperatures do not exceed 550F, piping and equipment are insulated with 85 per cent magnesia. For higher temperatures, a combination in-



General view of new kraft board and paper mill of Fibreboard Products, Inc., at East Antioch, Calif.

sulation is used consisting of an inner layer of diatomaceous silica and an outer layer of 85 per cent magnesia. The combination takes advantage of the resistance to high temperatures of the diatomaceous silica and the low conductivity of the 85 per cent magnesia.

Tables I and II list the insulation thicknesses used. The basic factors considered in choosing these thicknesses included maximum design temperatures, size of piping and equipment, and desired temperature control. Special consideration was given to the fact that the ambient air temperature is higher than average.

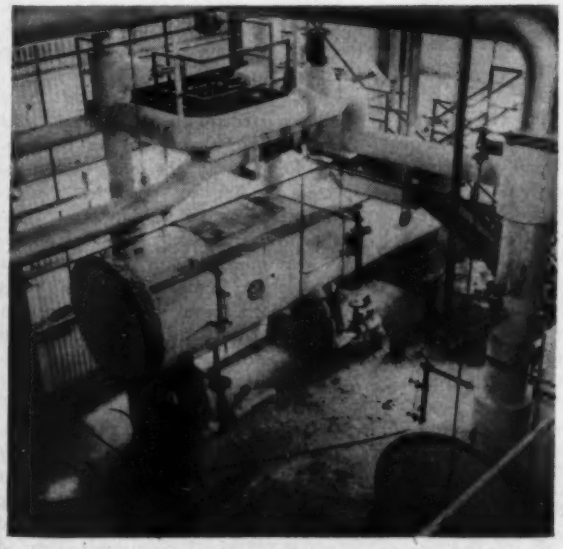
Plant equipment

Designed for 150 psi pressure, three welded A. O. Smith stainless steel lined digesters convert the chips to pulp. The digesters discharge into a blow tank equipped with agitators and dilution nozzles. Flash steam from the blow tank is sent through an accumulator and liquor heat exchanger designed to operate at 160F. Pulp from the blow tank is fed to four Improved Paper Machinery Corp. washers and a deknotter, and thence to storage tanks.

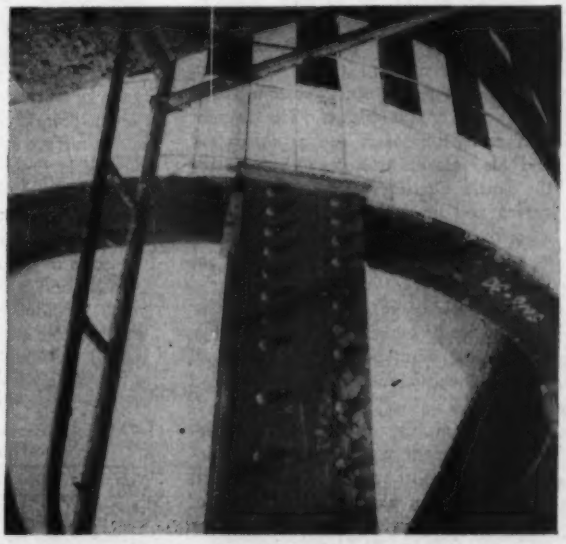
Black liquor from the blow tank is fed to a six-body shell and tube sextuple-effect evaporator of the long tube type, heated by steam at 25 psi. The evaporator concentrates the black liquor from 15 per cent solids to 50 per cent solids. The liquor is further concentrated to 62 per cent solids in a cyclone type evaporator heated by flue gases at 700F leaving the recovery boiler. The shell and tube evaporators are designed to give an economy of approximately 5 lb. of evaporate per lb. of steam furnished.

The recovery furnace is a Babcock & Wilcox-Tomlinson type designed for 28,100 lb./hr. black liquor solids, with steam generated at 600 psi, and 700F. Hot smelt from the furnace flows into a tank where it is dissolved at a resultant temperature of 140-180F and is then known as green liquor. This liquor is pumped to a causticizing plant, where it is mixed with hydrated lime to remove the carbonate in the green liquor which is precipitated as calcium carbonate, leaving sodium salts, principally sodium hydroxide, in the liquor. After clarification, this liquor is re-used in the wood chip digesters.

The causticizing plant equipment includes a white liquor clarifier, a green liquor clarifier, a lime mud washer, a dregs washer and a kiln, the latter being arranged to burn either natural gas or fuel oil to convert the calcium carbonate back to lime for subsequent remix-



Feedwater make-up evaporators and steam and hot water piping insulated with 85 per cent magnesia



Digester being insulated with 85 per cent magnesia blocks finished with cement troweled on wire mesh over the insulation

ing as hydrated lime with the green liquor.

In addition to the recovery unit, which produces 109,000 lb. of steam per hour, there are two 160,000 lb. per hr. oil or gas-fired steam generators that supply steam at 600 psi, 700F.

Other equipment included in the insulation specifications are turbogenerators, pumps, heaters, ducts and similar auxiliary equipment.

A 10 in., 600 lb., 700F line was run from the power plant to the wood room and a 16 in., 25 lb. turbine exhaust return line was run to the paper mill, both lines being 1,400 feet long. These lines were insulated in accordance with Pipe Insulation Thickness (Table 1).

Insulation application

Where possible, double layer construction was used, joints in the outer layer of insulation being staggered with those of the inner layer. Expansion and contraction of high temperature equipment may cause joints between insulation blocks or sections to open. With the staggered joints, there is no path of heat to escape from the hot surface to the outside. As a further precaution, all joints were sealed with insulating cement.

Pipe insulation was wired on with No. 16 gauge copperweld wire loops spaced one foot apart. Ends of pipe insulation near flanged connections were beveled off to permit easy removal of bolts without damage to the insulation.

Flanges were insulated with sectional or segmental insulation, cut to fit, of the same thickness as that on adjacent piping. To prevent heat escape around the flange edge, the flange insulation was lapped over the pipe insulation by at least 2 in.

Fittings and valves on pipes 4 in. in diameter or larger were insulated with blocks to a thickness of ½ in. less than that on the adjacent piping. A ½ in. coat of asbestos cement was then troweled on over the blocks. The cement coat seals the joints in the insulation and also serves as a smooth base for the finish. On lines 3½ in. or smaller valves and fittings were insulated with asbestos cement to a total thickness equal to that of the adjacent pipe insulation.

On vessels of small diameter, the insulation was secured with No. 14 gauge copperweld wire; on large vessels, galvanized steel bands were used instead of wire.

To prevent the insulation from slipping, equipment was provided with insulation support rings. The supports were welded in place at the bottom of the vessel and at equal intervals along its entire height. The projecting leg is ½ in. narrower than the thickness of the insulation and is equipped with holes to provide anchor points for tie wires. On horizontal tanks or vessels the supports were welded along horizontal center lines of cylindrical shells and along both heads of the vessel.

On conical or convex sections of tanks or vessels, metal anchors such as punched angle clips or nuts were welded to the surface and spaced in a pattern of concentric rings, with equal spacing between the anchors in each ring and between rings. The insulation blocks were fixed in place with wires drawn through the holes in the anchors.

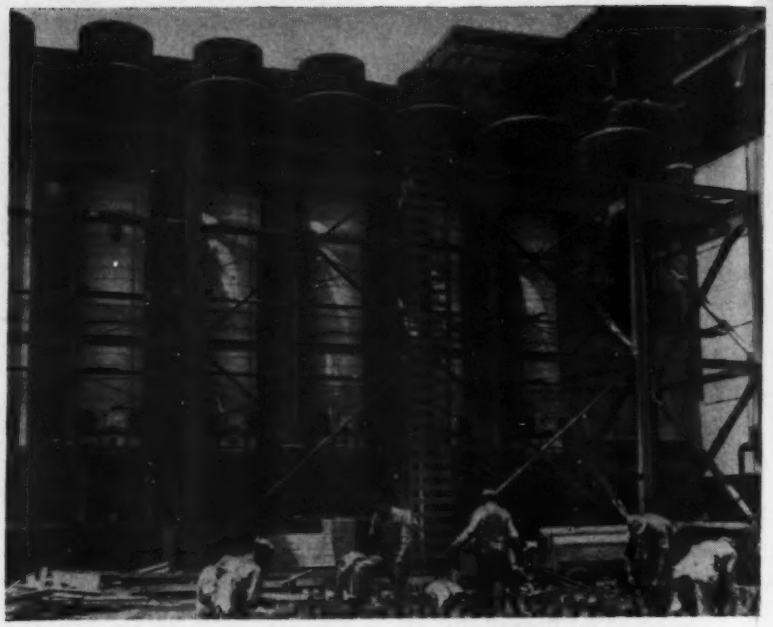
Insulation around manholes, nozzles, yokes, handholes, and other openings was beveled off so that bolts may be removed without hitting against the insulation. In some cases, a metal strip or "toe" was tackwelded around the opening as further protection for the insulation.

Cleanout doors, removable heads, etc., were insulated individually so that they can be removed without disturbing the adjacent insulation.

Duct and piping expansion joints were covered with removable steel sleeves before the insulation was applied. In this way, the joints can be inspected and serviced periodically without damage to the insulation.

Pipe, valve, flange and fitting insulation was finished with a 6 oz. pasted canvas jacket. Equipment insulation was finished with a coat of asbestos cement mixed with portland for a hard finish surface. To make the finish adhere better, the cement was applied over a layer of hexagonal wire mesh.

To prevent air inleakage, boiler insulation, as well as insulation on boiler fans, air ducts and flue gas ducts, was given an additional coat of asphaltic plastic cement. The plastic was keyed through hexagonal wire mesh stretched over the cement coat.



Sextuple effect black liquor evaporator being insulated with 85 per cent magnesia

TABLE I—Pipe Insulation Thickness (Nominal Inches)

85% Mag. — 85% Magnesia
Diatom. Sil. — Diatomaceous Silica

	Pipe Size (Inches)			
Temp. (F)	½-3½	4-10		12 and larger
150-250	1 in. 85% Mag.	1 in. 85% Mag.		1½ in. 85% Mag.
250-350	1 in. 85% Mag.	1½ in. 85% Mag.		2 in. 85% Mag.
350-450	1½ in. 85% Mag.	2½ in. 85% Mag.		3 in. 85% Mag.
450-550	2 in. 85% Mag.	2½ in. 85% Mag.		3 in. 85% Mag.
	½-1½	2-4½	5-10	12 and larger
550-700				
inner layer	2 in. Diatom. Sil.	1½ in. Diatom. Sil.	1½ in. Diatom. Sil.	1½ in. Diatom. Sil.
outer layer		1½ in. 85% Mag.	1½ in. 85% Mag.	2 in. 85% Mag.
700-800				
inner layer	2 in. Diatom. Sil.	1½ in. Diatom. Sil.	1½ in. Diatom. Sil.	2 in. Diatom. Sil.
outer layer		1½ in. 85% Mag.	2 in. 85% Mag.	2 in. 85% Mag.

TABLE II—Equipment Insulation Thickness (Nominal Inches)

Temp. (F)	Thickness
150-250	1½ in. 85% Mag.
250-350	2 in. 85% Mag.
350-450	2½ in. 85% Mag.
550-700	1½ in. Diatom. Sil., 2 in. 85% Mag.
700-800	2 in. Diatom. Sil., 2½ in. 85% Mag.

Fuses should be removed with insulated fuse pullers

Be sure it is the right switch for the machine and open quickly

How to guard against . . .

Electrical hazards in the pulp mill

A. S. COOK
Quebec Pulp & Paper
Safety Association, Inc.

Although the almost universal use of electricity as a source of motive power has eliminated many pulp mill hazards, there are certain dangers closely connected with the installation, maintenance, and use of electric wiring and equipment. The control of most of these hazards is neither difficult nor expensive, but ignoring or neglecting them may lead to serious accidents. Precautionary measures developed and approved by industry will, if consistently applied, result in the elimination of most pulp mill electrical hazards.

Since the principal electrical hazards in a mill are shock and flash burns, it is well to consider the factors involved when electricity passes through the body. Determining the effect of the shock are:

1. The type of circuit and its frequency.
2. The voltage of the circuit.
3. The resistance of the body.
4. The current that flows.
5. The pathway of the current through the body.
6. The duration of the contact.

Effects of electricity on the body

There is a tendency to regard the 110-volt circuit as being a safe one at all times. However, a number of fatal accidents have occurred on such circuits, particularly with the presence of moisture, which lowers the resistance of the skin to electricity. There is, of course, a greater danger of severe or fatal injury if the current passes through some vital organs than if it merely passes from one finger to another on the same hand.

The principal effects of the passage of electricity through the body can result in any one of the following six conditions.

Conscious of the Shock—a slight shock may result in temporary partial deafness, a ringing in the ears, and sore muscles.

Musculature Contractions—the muscles contract when contact is made with an electric circuit; this may be so sudden and severe that the victim will be thrown clear of the circuit, possibly with broken bones, or may suffer convulsions.

Electric Burns—burns are of two types: heat and electric; the heat burn results from the electric arc that may be formed at the contact, while the electric burn is usually a reddish spot on the skin that may indicate a deep burn to the underlying tissue.

Loss of Consciousness—sometimes artificial respiration is necessary to bring the victim back to consciousness after suffering an electrical shock.

Paralysis—a temporary paralysis of the nervous system may be caused by shock.

Death—low voltages kill through ventricular fibrillation, which stops the circulation of the blood; high voltage shocks cause the destruction or inhibition of the nerve centers, resulting usually in asphyxia.

Safeguards against shock

In making electric repairs, six precautions have been recommended: (1) Before working on electric circuits pull and lock the line switch in the "off" position. (2) Use only non-metallic ladders to reach overhead electric lines. (3) Check terminals with a meter or lamp tester to make certain that the circuit is dead. (4) Insure good ground connections by "jumpering" where pipe coupling may be faulty. (5) Short dead wires as a safeguard. (6) The same person who locked out should unlock and restore the line to use.

In changing light bulbs, the power should be shut off. This is important in moist areas or when the work is done from a ladder, where even a slight shock might cause loss of balance and a serious fall. Bulbs less than 8 feet above the floor level should be guarded, and where necessary globes should be both vaporproof and waterproof.

Fuses

Removing and replacing fuses in motor and lighting circuits involves danger of electric shock and of arc flashes. Ordinary circuits of 110 to 220 volts may cause fatal shock, or flashes may cause serious injuries. These dangers can be avoided by pulling the switch to "kill" or de-energize the circuit whenever possible.

When the power supply cannot be cut off because of other circuits connected to the same switch, the workmen should stand on something offering insulation from the ground and keep one

To be sure, apply your own lock

Reject defective equipment; report and correct all unsafe conditions

hand in his pocket so as to avoid touching a grounded object as the fuse is removed with insulated fuse-pullers. The supply end of the fuse should be pulled first, and when the replacement is made the supply end should be inserted last.

As an extra precaution, the workman concerned with changing fuses should turn his face aside during the operation so as to avoid a possible flash. The ideal measure to be taken in such a situation is to insist that he wear safety goggles.

A substitute for a fuse of proper capacity should never be used. Replacement usually should be of the same capacity as the one removed. A plant electrician should always be consulted when doubt arises as to the recommended fuse rating.

Switches

The four general precautions to be followed in opening and closing electrical switches so as to avoid serious accident should be stressed among the working force of the mill. (1) Be certain that all circuit and operating conditions are correct. (2) Wear rubber gloves, goggles and any other protective equipment required by company rules. (3) Check markings to be sure that the right switch is being operated. (4) Get in a safe position for operation; avoid physical strains.

An enclosed switch should always be operated with the left hand. The handle is invariably on the right, and when operated with the left hand the body of the operator will be out of direct line with a flash should one occur. The switch should be opened quickly and firmly with the face of the operator turned away.

When opening a disconnecting switch by the "inching method," slowly pull the blade outward until it barely clears the clip. If there is no "power" arc, pull the blade all the way. If there is a "power" arc, close the switch at once and find the cause. In closing the disconnecting switch use one firm, quick motion; be certain that the blade is firmly and properly seated in the clip.

In opening a disconnecting switch by the "quick break method," use one steady fast motion; pull the blade all the way out from the clip without stopping. Again, close the switch with one firm, quick motion, making sure that the blade is firmly and properly seated in the clip. Whether opening or closing a switch by either method, avoid slamming, this to prevent damage to the equipment. After each and every switching operation, look at each switch blade to ascertain whether it is opened or closed correctly.

If switches are not locked out, the hazards to men working on equipment are numerous. Workers may receive electric shocks and burns, or they may get their hands or other parts of their bodies caught in machinery accidentally started by another member of the crew.

As a general rule, every man who is to work on equipment should secure his own card or padlock on the control device and remove it when the work is completed. Machinery is not to be started until every person who has been at work on it has removed his card or lock. No man should be permitted to remove another's card or lock even if given permission by him to do so.

Extension cords

General rules concerning extension cords must be adhered to at all times to assure safety in the mill. (1) Plugs with cracked shells, bent or loose prongs and screws should be replaced. (2) Patching a frayed or torn cord or splicing for length is to be avoided if a new one can be had. (3) Exposure of a cord to abuse of aisle traffic can be dangerous; suspend it or protect it with boards. (4) Exposure to nails or sharp corners may tear the covering and cause shorts; plan the best possible layout of wiring so that such dangers are prevented. (5) Cords must at all times be kept away from water, oil, solvents, etc., and away from flames or intense heat. (6) Cords must be handled carefully at all times; in removing a plug the cord must not be jerked but pulled smoothly and firmly. (7) In cord storage the cord should be piled neatly and with no weight from above.

Portable electric hand tools

In the use of electrical hand tools, only equipment that is in good condition should be handled. Equipment must be properly grounded. And the following unsafe conditions should be reported: defective or broken insulation on the cord; improper or poorly made connections to terminals; broken or otherwise defective plugs; loose or broken switches, and sparking brushes.

References

Kouwenhoven, W. B., "Electricity and the Human Body."

National Safety Council, Accident Prevention Manual; Data Sheet D-Gen-41 (Methods of Locking Out Electric Switches); Data Sheet D-Gen-21 (Electric Extension Cords); Data Sheet D-Gen-42 (Grounding of Portable Electric Equipment).

Industrial Supervisor, S.PP No. 76 (Portable Electric Hand Tools).

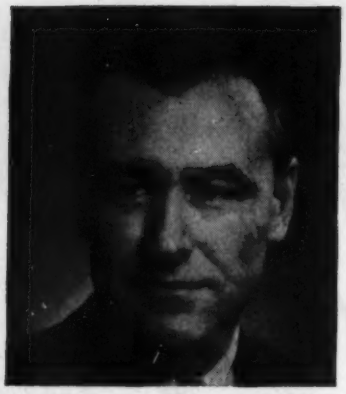
PAPER BAGS capable of holding 8 gallons of water each are being used to fight forest fires . . . Eight of these bags dropped simultaneously from a plane wet an area approximately 200 feet by 20 feet . . . . A single plane carrying 20 such bags brings to a forest fire about 1½ tons of water . . .

The natural fiber molds used in Europe's earliest paper-making mills probably gave way to metal wire molds before the 14th Century. Guilds of wire smiths and wire drawers existed as early as 1351.

WINDOW CURTAINS of patterned paper were sold in New York City as early as 1760.

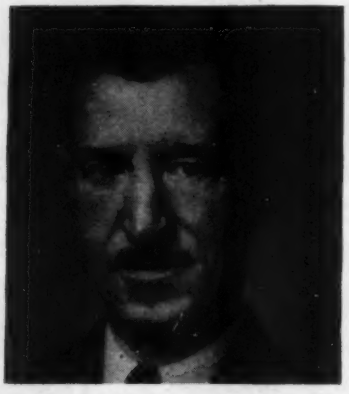
Odd Bits

ARTIFICIAL LIMBS were made of papier maché in London in the mid-1860's



Gordon Godwin
General Chairman

J. B. Matthews
1952 Chairman



W. A. E. Pepler
Manager, Woodlands Section

Forestry Practices Topic of CPPA Woodlands Section

More than 600 delegates attended the 34th annual meeting of the Woodlands Section of the Canadian Pulp & Paper Association, which was held March 26 through 28 at the Mount Royal Hotel, Montreal. The three-day session featured discussions on the various forestry problems, including reforestation, mechanized woods operation, tree farm and forestry extension work.

Elected chairman of the executive council for 1952-53 was J. B. Matthews, chief forester for Abitibi Power & Paper Co. Ltd., Toronto. At one time a regional forester for the Lands and Forest Department of Ontario, Mr. Matthews joined the Woodlands Section in 1942. He was chairman of the silviculture committee for 1948-49; and for the past three years he has been chairman of the woodlot program committee.

Gordon Godwin was general chairman of the meeting. He is assistant general manager of woodlands for Ontario Paper Co. Ltd., Thorold, Ont.

Godwin Reviews Progress

That there is no cause for complacency among managers of forest lands was stressed by Mr. Godwin in his annual report. "In the last two decades," he declared, "the pulp and paper industry has taken the lead in forest management. We state proudly that we operate on sustained yield—that we cut no more than the forest is capable of growing. . . . We will have plenty of trees forever to maintain our industry, but that's not good enough.

"Our duty as forest managers—to the industry and to the nation—is to increase the supply of wood fibre to meet an evergrowing demand for pulp and paper," the speaker continued. "We are spending a lot of money and doing a good job on fire protection, on inventories and preliminary working plans, and on road construction, without which forest management is impossible. Now we must engage on a major effort to grow more trees and better trees. The industry should prepare for substantial expenditures on applying present silvicultural knowledge and on getting busy with fundamental research. If we are successful in improving quality and increasing the supply, the outlay on silviculture will be more than returned. The silviculture committee of the Woodlands Section has recommended that research be undertaken on a number of problems in the interest of the industry's forest management plans. Three research projects pertaining to direct seeding, cutting methods, and woodlots are now underway."

Mr. Godwin reviewed the work undertaken by the various sections during the year. He said that on the recommendation of the nutrition committee, Dr. Douglas Gibson of the University of Saskatchewan will conduct a survey of the nutrition needs of forest workers and advise on the supply and preparation of foods. Courses for camp cooks and their instructors are also under preparation.

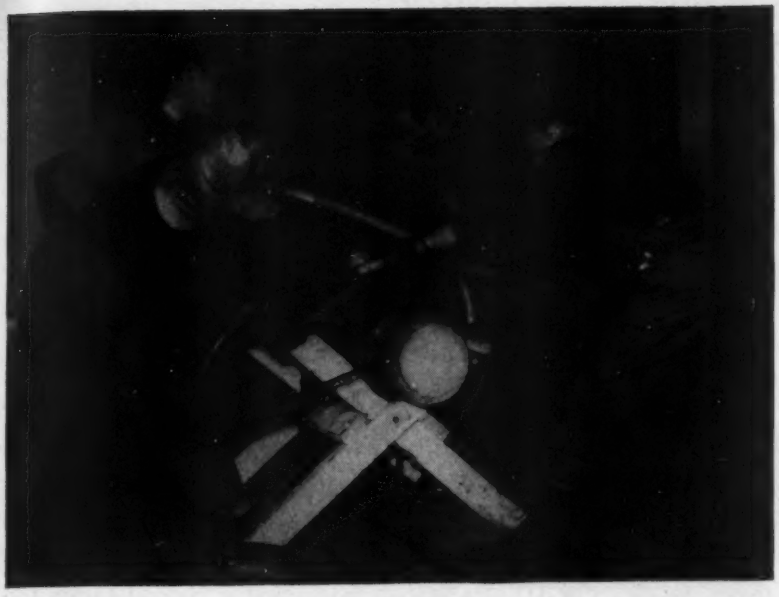
The committee on horses studied the use and care of horses on logging operations. In view of a possible shortage of machines and parts, an equipment survey was made to provide data in the event priorities assistance is required to keep production machinery in operation. Other section activities included studies of aerial surveys, forest fire protection methods, barking wood by using chemicals, controlling biting insects, and so on.

Group Sessions

During the three-day gathering group sessions were staged. These meetings dealt with the various woodlands problems and included woods labor, forest management, and woods operating. Chairman of the labor session was H. A. Sewell, general manager of woodlands for Ontario Paper Co., Thorold; forest management, W. F. McColm, woodlands manager for Donnacona Paper Co. Ltd., Donnacona, Que., and woods operating, A. H. Burk, woods manager for KVP Co., Ltd., Espanola, Ont.

Workmen's Compensation

Successful application of a merit system in determining individual company assessments for workmen's compensation was described by W. L. Bennett, presi-



FIGHTING IT OUT for the 1952 Canadian Bucksaw Championship at the meeting of the Woodlands Section, CPPA; winner was Gerard Lavoie

dent of the Quebec Pulp & Paper Safety Association. The system was established by the Association in cooperation with the Quebec Workmen's Compensation Commission and the pulp and paper firms of the province.

The Quebec Compensation Act of 1931 authorized groups of employers to form accident prevention associataions. Shortly thereafter the Safety Association was formed. For 10 years the companies assumed mutual responsibility for all accident claims. At the end of each year they met with the Commission and determined a flat rate to determine all cash payments of the past year and estimates of the coming year's claims. Under this system companies with few accidents paid the same rate as those with many claims. Hence, unless all cooperated to reduce accidents, the rate would and did increase.

In 1941 it was decided to introduce a merit system covering payments on behalf of woods workers' accidents. Under the plan provisional assessment is determined each year; but if a company earns a lower rate because of fewer accidents, its assessment is reduced accordingly. Minimum and maximum rates have been set.

Employee Relations

"Employee Relations in the Woods" was the topic discussed by E. R. Complin, industrial relations manager for Canadian Industries Ltd., Montreal. He pointed out that a basic problem in pulpwood harvesting is high labor turnover.

Suggesting methods of reducing this turnover, Mr. Complin said that at present most woodswork is highly seasonal, and perhaps more workers would remain on the job if permanent employment could be offered. As homes for workers' families, roads and other facilities are built, and year-round harvesting plans are implemented, a higher degree of labor stability, he thought, would develop. He cited various pulp and paper operations where such developments are now in effect. "Improvement in the attitude of supervisory personnel," Mr. Complin declared, "should result in reduced labor turnover."

He suggested that meetings of foremen be held before the harvesting season to promote education in human relations. Contractors could also be told how the company expects them to treat their men. As another way of reducing turnover, the speaker proposed that trained personnel workers, preferably experienced woodsmen, travel about the camps and be in touch with the foremen.

Camp Cooks

H. J. Dawson, commissary supervisor for Quebec North Shore Paper Co., Baie Comeau, discussed the importance of good camp cooking for woods personnel. Some $12,000,000 is spent annually, he said, by the pulp and paper industry on food for its forest workers; the men should receive balanced and palatable meals. "Poor meals are nutritionally and financially a loss," he continued. "Hence, proper training of camp cooks is invaluable."

Realizing the importance of having skilled cooks in its camp, Quebec North Shore has undertaken a training program for cooks. A school is conducted for them; cook instructors travel around the camps to supervise and advise, and the commissary department assists them by issuing menus, suggesting methods of preparing certain dishes and kitchen layouts, and supplying improved and suitable utensils.

Water Bombs vs. Fires

Experiments in water bombing of forest fires, which with insects and disease consume more of Canada's forest wealth each year than does its billion dollar pulp and paper industry, were described by Q. F. Hess, district forester, Ontario Department of Lands and Forests, Sault Ste. Marie.

His department, said Mr. Hess, is conducting tests in which specially made paper bags, holding 3½ gallons of water, are dropped on fires from aircraft at a height of 300 feet. On hitting the ground, they not only wet the area, but add water vapor to the air, thus retarding the advance of the fire. The tests show that if properly employed, this technique can slow down or stop the spread of forest fires. "If the rate of spread of a fire can be slowed down or stopped until the fire fighters arrive," he added, "then their job is made easier. Water bombing from aircraft is a likely method of effecting such control."

Silvicultural Requirement and Cutting Methods

Plans for managing a pulpwood forest tract of 757 square miles in Quebec's Laurentide Park on a sustained yield basis and using two different cutting methods were discussed by Francois Matte, chief forester for Donnacona Paper Co. Ltd., Quebec.

"Depending on the forest stand," he said, "there are various management methods that can be employed to establish conditions for sustained yield. Mature and overmature trees can be harvested, thus permitting young stands to grow. The mortality rate by natural causes . . . can be curtailed by clearing.

"In the overmature stands of the forest unit, Donnacona is using the clear-cutting methods of harvesting. These stands are subject to windfall, insects and disease. The rate of growth in them is decreasing. Any younger trees have been repressed so long by the older ones that they would recover only with great difficulty. Complete clearing of the area will increase the rotting of thick humus in the soil and thus make it of more value to the new crop that is already coming up.

"Other areas in the unit under the management plan are being harvested in a different way. The company proposes to follow a planned cutting cycle of 10 years. Each stand and each tree is to be handled individually. Mature and overmature trees will be marked for removal to permit the growth of sup-

pressed trees. Younger, healthier trees that better withstand the attacks of insects, disease, and windfalls will be grown.

"To implement this selective cutting plan, camps, dams, and year-round trucking roads must be constructed. The plan will be introduced gradually by the company. When in effect, operations will be continuous, and there will be a better rate of growth in the forest."

Pulpwood Procurement

The operation of a forestry extension service to assist farmers and others in the proper management of their woodlots was described by M. R. Wilson, resident manager of Canadian International Paper Co.'s tree farm at Grenville, Que. This year-old service is operated by the company in conjunction with its wood procurement office for its Hawkesbury, Ont., mill. It was started after a process had been developed for producing dissolving pulp from most of the numerous hardwood species in counties adjacent to the Hawkesbury mill.

In an effort to persuade woodlot owners not to overcut or abuse their properties to meet this new market, but to improve them and regard them as a perpetual source of income, and also to discourage speculation by those who would buy woodlots and clear them out for immediate gain and no future use, the company began its forestry extension service.

Company forester-purchasing agents discuss forestry matters with every supplier and advise them on the proper management of their woodlots. To provide an experimental and demonstration area, Canadian International set up a 3,000-acre forest farm near Grenville. Farmers and other woodlot owners are invited to visit the farm to see the effects of modern harvesting methods and some of the research projects being undertaken. The company's contract with its largest supplier in the area requires that the wood be cut in accordance with sound forestry practice.

Automobiles and Horses

The proper care and maintenance of automotive equipment, particularly engine cooling systems, was discussed by G. K. Mantha, National Carbon Ltd., Montreal. He told of the operating factors affecting the maintenance of the system's operations. It must be clean and rust-free, all parts must operate to prevent leakage and maintain satisfactory temperatures. Regular inspection of all parts of the cooling system is essential to ensure that they are in good condition.

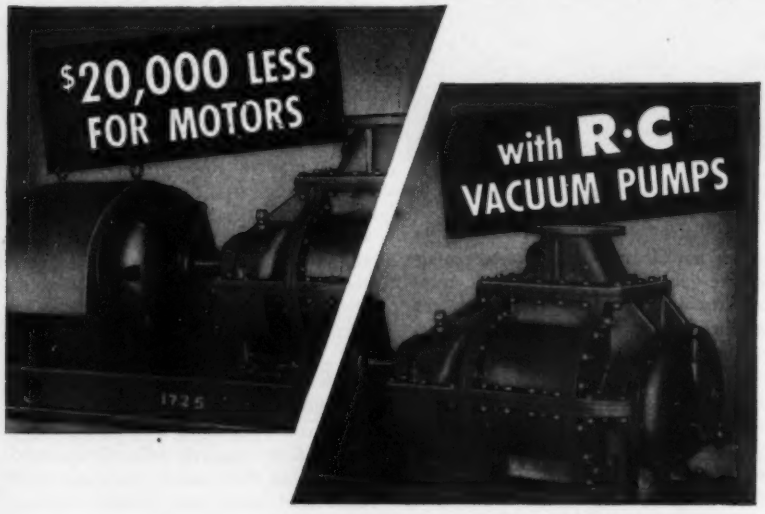
"Horses in the Pulpwood Industry" was the subject of a paper presented by J. L. Kelly, assistant to the manager of the North Woodlands Division of Price Bros. & Co. Ltd., Chicoutimi, Que. "Over 20,000 horses, representing a capital investment of some $6,000,000, are employed in pulpwood harvesting operations in eastern Canada," he said, "and their number is not expected to be reduced in the next five years." Mr. Kelly is chairman of the committee on horses of the CPPA Woodlands Section.

"... the horse still plays an important part in pulpwood operations," the speaker declared. "There is as yet no mechanical substitute for it in skidding or short hauls of logs in steep and difficult areas. Therefore, it is of importance to do everything possible to lower the accident and sickness mortality of horses through improved feeding and stabling, providing the necessary veterinary services and particularly training men to handle horses better."

Holding Boom

Model scale tests to determine the best design and location of a pulpwood holding boom upstream from a hydro-electric power plant dam being constructed on the Manicouagan River by Quebec North Shore Paper Co., Baie Comeau, were discussed by G. R. Lord, associate professor of mechanical engineering at the University of Toronto.

The objective of the model study was



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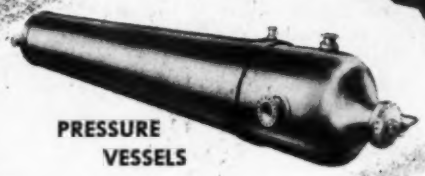

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to establish the best location for a safe pulpwood holding ground, with the least capital cost, and having the lowest operating cost per cord of wood. To answer these requirements, studies of water velocity, currents and the movement of wood were made in a specially constructed model in the university's hydraulics laboratory.

Leisure Time Classes

A program of leisure time study classes in basic English, citizenship and other subjects for immigrants and others working in the pulpwood camps of Spruce Falls Power & Paper Co. Ltd. was described by C. C. Wright, superintendent of industrial relations in the company's woodlands department.

A program of study classes was evolved in cooperation with the community programs branch of the Ontario Department of Education. A Kapuskasing high school teacher assisted by two company staff members supervise the work of the instructors, who may be clerks, scalers, cutters or haulers. They are paid by the Education Department and conduct classes in the camps usually three nights a week. The company furnishes blackboards, maps, sundry materials, class room facilities, and transportation needs. Teaching media are supplied by the Department.

Bucksaw Contest

A world's speed record was established during the finals of the Canadian bucksaw contest held during the meeting of the CPPA Woodlands Section. Winner was 21-year-old Gerard Lavoie from the Gaspe Peninsula, who is employed by Quebec North Shore Paper Co. His average for six cuts in 10-inch spruce logs, 7.1 seconds, was a good second better than the previous record in the five-year-old competition. He had two single cuts of 6.5 seconds and 6.9 seconds. Nine lumberjacks took part in the finals, held in the ballroom of the Mount Royal Hotel.

Awards

In recognition of meritorious work in woodlands research and operations, the Woodlands Section granted the following awards, consisting of a bronze plaque, citation, and $100 each.

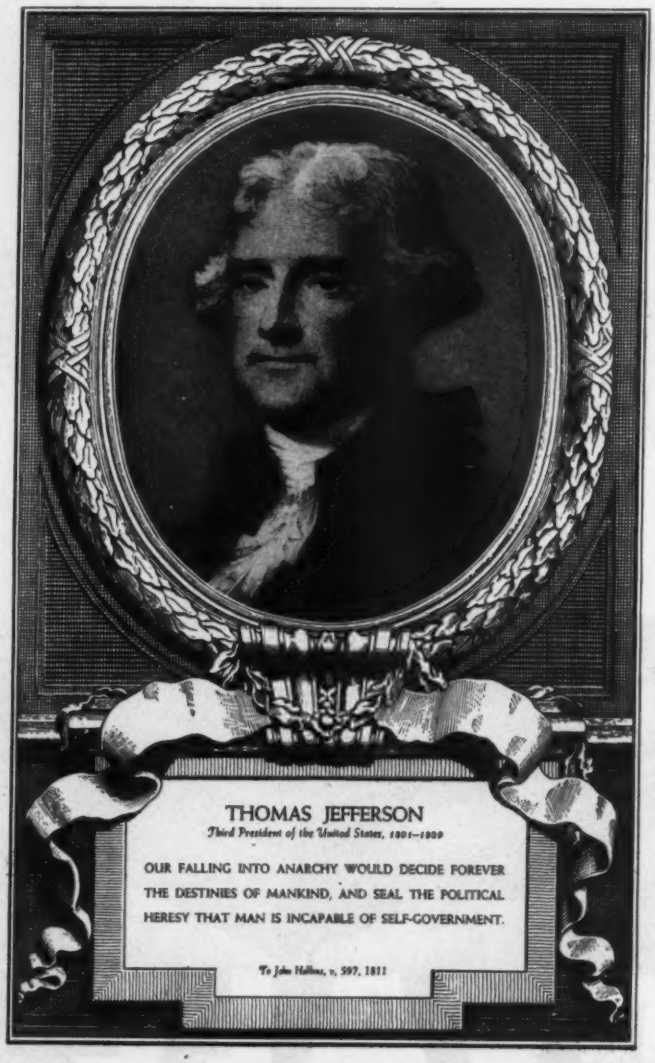
J. A. Bothwell Award for achievement in the furtherance of forest conservation in Canada went to M. R. Wilson, resident manager for Canadian International Paper Co. at Grenville, Que. Donated by St. Lawrence Corp., the award was presented to Mr. Wilson for his work in the establishment and operation of his company's tree farm at Grenville and for his forestry extension work in promoting better woodlot management in the surrounding area.

Ellwood Wilson Award for the most effective industrial application of research projects instigated and carried out either by the Woodlands Section, in cooperation with the Pulp & Paper Research Institute of Canada, or by a member company, was presented to J. Leo Kelly, assistant to the manager of the North Woodlands Division of Price Bros. & Co. Ltd., Chicoutimi, Que. He received it for his work in the development and application of the snowmobile as a hauling unit. The award is donated by Anglo-Canadian Pulp & Paper Mills Ltd., Quebec.

Mechanization Award went to W. S. Carlson, district superintendent for Long-Lac Pulp & Paper Co. Ltd., for his paper on the mechanical handling and movement of pulpwood on his company's limits. The award is donated by Fraser Companies Ltd.

Special Award of the Woodlands Section of a medal and citation went to Alexander Koroleff, director of woodlands research for the Pulp & Paper Research Institute of Canada in recognition of his 25 years of service to the pulp and paper industry of Canada.

Suggestion Box Contest $100 first prize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for the best suggestion submitted during the past year by an employee of a member firm went to N. Nylund of St. Lawrence Corp., Ltd., Nipigon, Ont., for his safety stove pipe designed to eliminate the dangers of fires in camps. A second prize of $50 awarded by the *Pulp and Paper Magazine of Canada* for the best suggestion from a junior member of the section went to D. Henderson, acting district logging supervisor for Canada Paper Co., Despinassy, Que., for his gravel road grader.

1952 Officers

At the annual business session of the Woodlands Section on March 26 the 1952 executive council was elected. Officers in addition to Chairman J. B. Matthews are as follows:

Vice chairman—J. H. Merrill, woods manager for Anglo-Canadian Pulp & Paper Mills Ltd., Quebec.

Councillors—R. S. Armitage, vice president in charge of woodlands for Price Bros. & Co. Ltd., Quebec; G. H. Fisk, eastern representative for Powell River Co. Ltd. and Pacific Mills Ltd., Montreal; Gordon Godwin, assistant general manager of woodlands for Ontario Paper Co., Thorold; F. A. Harrison, manager of woodlands for Canadian International Paper Co., Montreal; H. P. Klenestiver, vice president and woodlands manager for Marathon Paper Mills & Co. Ltd., Port Arthur, Ont.; R. G. MacFarlane, woods manager, Fraser Companies Ltd., Edmudston, N.B.; G. W. Phipps, assistant general manager of woodlands for Kimberly-Clark of Canada Ltd., Kapuskasing, Ont.; W. B. Southon, woodlands manager for Great Lakes Paper Co. Ltd., Port Arthur, Ont.; L. L. Wetmore, divisional woods manager, St. Lawrence Corp. Ltd., Three Rivers, Que., and W. F. McColm, woods manager for Donnacona Paper Co. Ltd., Quebec.

Ex-officio councillors—C. R. Mills, manager, Ontario Forest Industries Association, Toronto, and Edgar Porter, manager, Quebec Forest Industries Association, Quebec.

W. A. E. Pepler is manager of the Woodlands Section.

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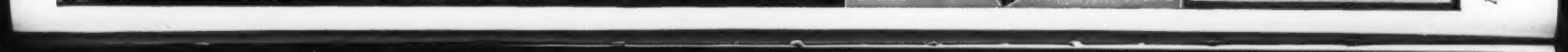
CPPA Pulping Conference and Technical Section Set for June

The International Pulping Conference of the Technical Section of the Canadian Pulp & Paper Association is scheduled for June 16-18 at Murray Bay, Que. Meetings are to be held at the Manoir Richelieu.

Following immediately after the Pulping Conference is the annual summer meeting of the section, which is to be held June 18-21, also at the Manoir Richelieu.

The proposed program of the Pulping Conference includes the following topics: Some Basic Properties of Lignin in Relation to Pulping; Distribution of Constituents of Wood; Diffusion and Penetration Mechanisms of Liquids into Wood; Influence of Wood Species on Chemical Pulping; Influence of Chip Size and Form on Chemical Pulping; High-Yield Chemical Pulping; Semi-Chemical Pulping; General Comparison of Various Bases in Sulphite Pulping; Effect of Important Variables in Sulphite Pulping; Effect of Important Variables in Sulphate Pulping; Reactions, Equilibria and Chemical Balances in Sulphate Pulping; Survey of Proposed Chemical Pulping Methods; Continuous Chemical Pulping; Size and Form Distribution of Fractions as Affecting the Physical Properties of Mechanical Pulp; Outstanding Problems in Mechanical Pulp Manufacture, and Chemical Treatments of Mechanical Pulp.

Topics tentatively scheduled for discussion at the summer meeting of the section include: high pressure dryers; electrical maintenance in pulp and paper mills; preventive maintenance; maintenance work loads and estimating crew standards; instrumentation for semi-chemical processes; trends in power generation; feed water treatment; utilization of condensate; evaluation of sulphite pulp for board; discussions on operating



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problems, printability problems, and the utilization of corrugated waste in the paperboard industry; use of the beta ray gauge; stock preparation; white-water systems; paper machine operation; Kesting process for manufacture of ClO_2; cleanliness of pulp; Bathurst BCM semi-chemical process; instrumentation in pulp and paper mills; rapid method for evaluating groundwood pulp; operation of the Oliver sheet former; pitch troubles and their alleviation; chemical composition of the "neutral fraction" of talloils, and operation of a new waste sulphite liquor evaporator.

Superintendents Set for Annual Convention

Several general conferences and eight group meetings will be featured at the 33rd Annual Convention of the Superintendents Association which is to be at the Sheraton-Cadillac Hotel, Detroit, June 17-19. Glen Sutton, national president, has reported that details of the program will be announced soon.

The theme subjects of the general conferences will be: The Paper Industry on Parade, Trade Conditions, and Human Engineering. The group meetings will cover sulphite, kraft, paperboard, plant and power engineering, high-yield pulping, paper converting, production methods, and paper machines. Several plant visits are contemplated.

Speakers Named for Lake Erie Folding Carton Forum

The Folding Carton Forum, a joint venture of Lake Erie Tappi and the Research and Technical Committee of the Folding Paper Box Association of America, is to be staged May 22 and 23 at the Hotel Carter, Cleveland. Speakers for the two-day session were recently announced.

At the closing evening session on May 23, R. S. Irwin of Summerville Ltd., London, Ont., is to speak on "Future of Folding Paper Cartons." His talk will be followed by one on "Cooperative Research for Industry Development?" by L. K. Burnett of Ohio Boxboard Co., Rittman, Ohio. The toastmaster at the session is to be W. Hasselo of Container Corp. of America, chairman of Lake Erie Tappi.

Morning and afternoon sessions on Friday will include symposiums on the various problems in carton manufacture. Speakers at the morning meeting will be J. P. Wiedner of Container Corp. of America, Philadelphia, who will talk on "Problems in Manufacturing Board for Folding Cartons"; F. H. Stowitts, Michigan Carton Co., Battle Creek, "Folding Carton Manufacturing Problems," and Walter Sooy, Gardner Board & Carton Co., Middletown, "Meeting the Customer's Requirements for Folding Cartons." Moderator will be F. D. Long of Container Corp. of America.

The afternoon session will include the following talks: "Folding Cartons from the Consumer's Viewpoint," W. L. Romney, Procter & Gamble, Cincinnati; "Testing Procedures for Folding Cartons," L. R. Ayers, Robert Gair Co., Piermont, N.Y., and "Development of Folding Cartons," H. S. Gardner, Fibreboard Products Co., Antioch, Cal. Moderator will be L. K. Burnett of Ohio Boxboard.

On the opening day of the meeting plant visits will be made to Great Lakes Box Co. and Dairypak, Inc., both of Cleveland, and Ohio Boxboard, Rittman.

Process Control Discussed

"Practical Process Control for Better Quality Control" was discussed at the April 18 meeting of Lake Erie Tappi. Speakers included Dennis Heindel of Container Corp. of America, who talked on "A Demonstration of the Densichron and an Explanation of Color Control"; Russell Lewis of Ohio Boxboard, "Instruments for Control of Folding Carton Quality," and R. F. Overmeyer of Shellmar Products Corp., "Color Control in Gravure Printing of Films and Paper."

Stream Pollution to be Discussed at FPRS Meeting

Stream pollution caused by pulp and paper operations and wood waste resulting from wood manufacturing operations will be among the topics discussed at the June 23 session on "Fibreboard and Chemical Utilization" at the sixth annual meeting of the Forest Products Research Society. The meeting will be held at the Schroeder Hotel, Milwaukee, June 23-25.

Moderator for the session will be Edward G. Locke, chief of the division of derived products at the Forest Products Laboratory, Madison, Wis.

The problem of "Pollution from the Pulping Process" will be discussed by Harry W. Gehm, technical director for the National Council for Stream Improvement. He will describe the neutral sulphite and semi-chemical pulping processes alone and in combination with kraft pulping, and how kraft pulping recovery techniques now in practice have reduced stream pollution loads to a marked degree.

J. F. Seaman, FPL chemist, will speak on "Status of Research in the Chemical Utilization of Wood Waste." He will discuss why wood wastes represent an enormous supply of organic raw material and hence a potential source of wealth, and why its utilization would be of much value in improved forest management.

The session is one of 10 at the FPRS meeting. The sessions will include reports on forest products research, lumber handling, fibreboard and chemical utilization, furniture manufacturing and finishing, barking methods, housing and construction, veneer and plywood, and allied forestry subjects.

Ohio Forestry Association
has elected Howard M. Wells of Wilkesville president for 1952. A timber owner, he is past president of the Ohio State Horticultural Society. Other new officers include Clay Stackhouse, first vice president; Edward Durrell, second vice president; Phillip Hampton, treasurer; Dr. K. Starr Chester and John Woodrow, members of the executive committee.

Oregon Forest Fire Assoc.
has elected J. R. Frum president for 1952. Mr. Frum is assistant vice president of Crown Zellerbach Corp. Other officers are William Ruhman of Coos Bay Lumber, first vice president; Nilis Hult of Hult Lumber Co., second vice president, and Carl V. Hersey, secretary-treasurer.

American Soc. for Quality Control
will stage its 1952 meeting May 22-24 at Syracuse, N. Y. Technical discussions and papers will be presented on the techniques of statistical quality control. A portion of the program is to be devoted to applications in the pulp and paper industry.

Waste Paper Institute
of the National Association of Waste Material Dealers, Inc., held its annual meeting recently in New York, N.Y. One of the guest speakers was Prof. Lyle C. Jenness, head of the department of chemical engineering at the University of Maine, who spoke on the topic, "Educational and Research Facilities at the University of Maine."

Northeastern Division,
Superintendents Association, has appointed Don Hall of Portland, Maine, as its industrial affiliate representative, to serve during 1952. Mr. Hall is associated with Eastwood-Nealley Corp., Belleville, N. J.

Pacific Coast Supts.
have appointed J. M. Wilcox of Electric Steel Foundry Co., Portland, to serve as industrial affiliate representative for 1951-52. The announcement was made by R. Burke Morden, secretary-treasurer of the APPMSA Pacific Coast Division.

Delaware Valley TAPPI
celebrated its 20th anniversary March 27 at the Engineer's Club, Philadelphia. Guest speakers on the program were to

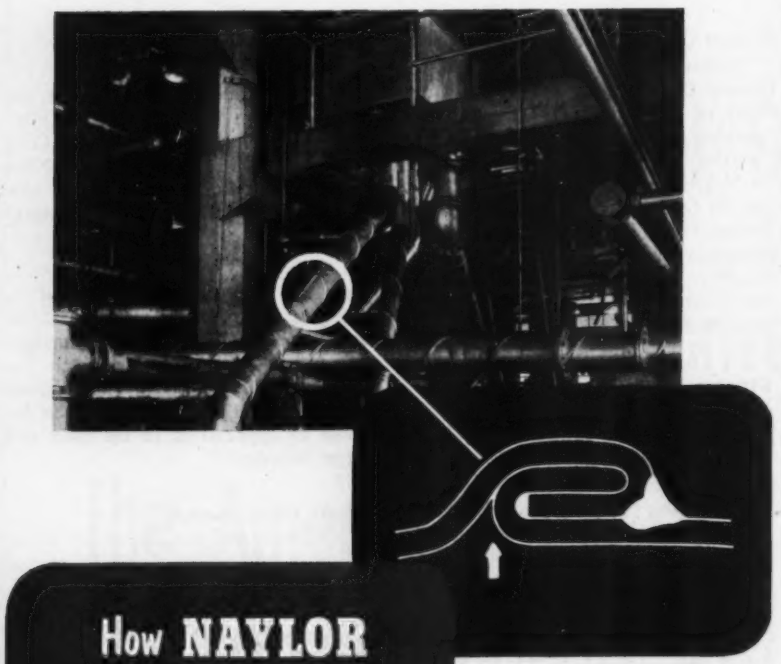
be E. J. Albert of Thwing-Albert Instrument Co. and K. P. Geohegan, national TAPPI president.

Northwestern Superintendents staged their spring meeting May 9-10 at the Hotel Faust, Rockford, Ill. On the program in addition to technical meetings was a tour of Beloit Iron Works, Beloit, Wis. Those attending the meeting also visited Woodward Governor Co., Rockford.

Northeastern Division, Superintendents Association, will stage its 1952 fall meeting September 1 at the Poland Spring House, Poland Spring, Maine.

Miami Valley Supts. report attendance of 132 at their March 21 meeting. The gathering, sponsored by Cincinnati Chemical Works, featured a trip through the administration buliding of Ciba Co., Inc., and a complete tour of the AZO plant of Cincinnati Chemical.

Western Forest Industries Association at its annual meeting at Portland, Ore., featured a panel discussion on the topic, "Toward Improved Utilization." Panel members were Glenn Hawkins, superintendent of Columbia Tree Farms; J. R. Pfeiffer, of the state forest products laboratory; R. S. Wertheimer, general manager of Longview Fibre Co., and A. C. Knauss of the Pacific Northwest Forest Experiment Station.



How NAYLOR gives you EXTRA SAFETY in Light-weight Pipe

This simple sketch gives you the inside story on the extra safety built into every section of Naylor light-weight pipe. The arrow points to the "heel" which extends the entire length of the pipe in spiral form. This acts as a continuous expansion joint absorbing shock loads, vibration, expansion and contraction stresses and strains which are so often destructive to welds on a rigid structure. No other light-weight pipe can match this performance. That's why so many engineers depend on Naylor Pipe in paper mill service. Write for Bulletin No. 507.

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Naylor Pipe Company
1236 E. 92nd St., Chicago 19, Ill.
New York Office: 350 Madison Ave., New York 17, N.Y.

Coming Events

TAPPI meetings

May 16-17—New England Section (joint meeting with the Connecticut Valley Division, Superintendents Association), Toy Town Tavern, Winchendon, Mass.

May 22-23—Lake Erie Section Folding Box Conference (joint meeting with the technical committee, Folding Box Association of America), Carter Hotel, Cleveland.

June 19-21—Empire State Section (joint meeting with the Niagara Branch, Technical Section, Canadian Pulp & Paper Association), Gen. Brock Hotel, Niagara Falls, Ont.

American Pulp & Paper Superintendents Association meetings

May 16-17—Connecticut Valley Division (joint meeting with New England Tappi), Toy Town Tavern, Winchendon, Mass.

May 23—Pacific Coast Division, Monticello Hotel, Longview, Wash.

June 6—Miami Valley Division, Orr Felt & Blanket Co., Piqua, Ohio.

June 17-19—National meeting, Sheraton-Cadillac Hotel (formerly the Book-Cadillac Hotel), Detroit.

Sept. 18-21—Northeastern Division, Poland Spring House, Poland Spring, Maine.

Oct. 8-10—Southern and Southeastern Divisions (joint meeting), Hotel Roanoke, Roanoke, Va.

Other meetings

May 11-14—American Institute of Chemical Engineers, French Lick Springs Hotel, French Lick, Ind.

May 15-16—Georgia Forestry Association, 28th Annual Meeting, Radium Springs.

May 15-16—Institute of Paper Chemistry, Sixteenth Annual Executives' Conference, the Institute, Appleton, Wis.

June 18-20—Canadian Pulp & Paper Association, Technical Section, Murray Bay, Que.

June 23-25—Forest Products Research Society, national meeting, Schroeder Hotel, Milwaukee.

Sept. 4-6—American Institute of Chemical Engineers, regional meeting, Palmer House, Chicago.

Sept. 8-12—Instrument Society of America, National Instrument Conference and Exhibit, Cleveland.

Typical wool showroom, where buyers make their selections.

Photographs courtesy of Wool Bureau, Inc.

Out Where Huyck Felts Begin

First, the fleece. From 1,500 classified types, buyers choose only those special wools that meet the exacting requirements of Huyck Felts. In the principal wool-growing countries of the world this discriminating selection goes on. For these must be just certain wools, rare and costly.

In they come, to the great wool warehouses at Rensselaer, New York. From this vast supply, skilled sorters select the grades specified for each type of felt, then blend them for the precise task the felt is to perform on the paper machine.

This is the first, and only the first step in making the famous Huyck felts which for 82 years have rendered such essential service to the pulp and paper industry.

KENWOOD TEXTILE PRODUCTS

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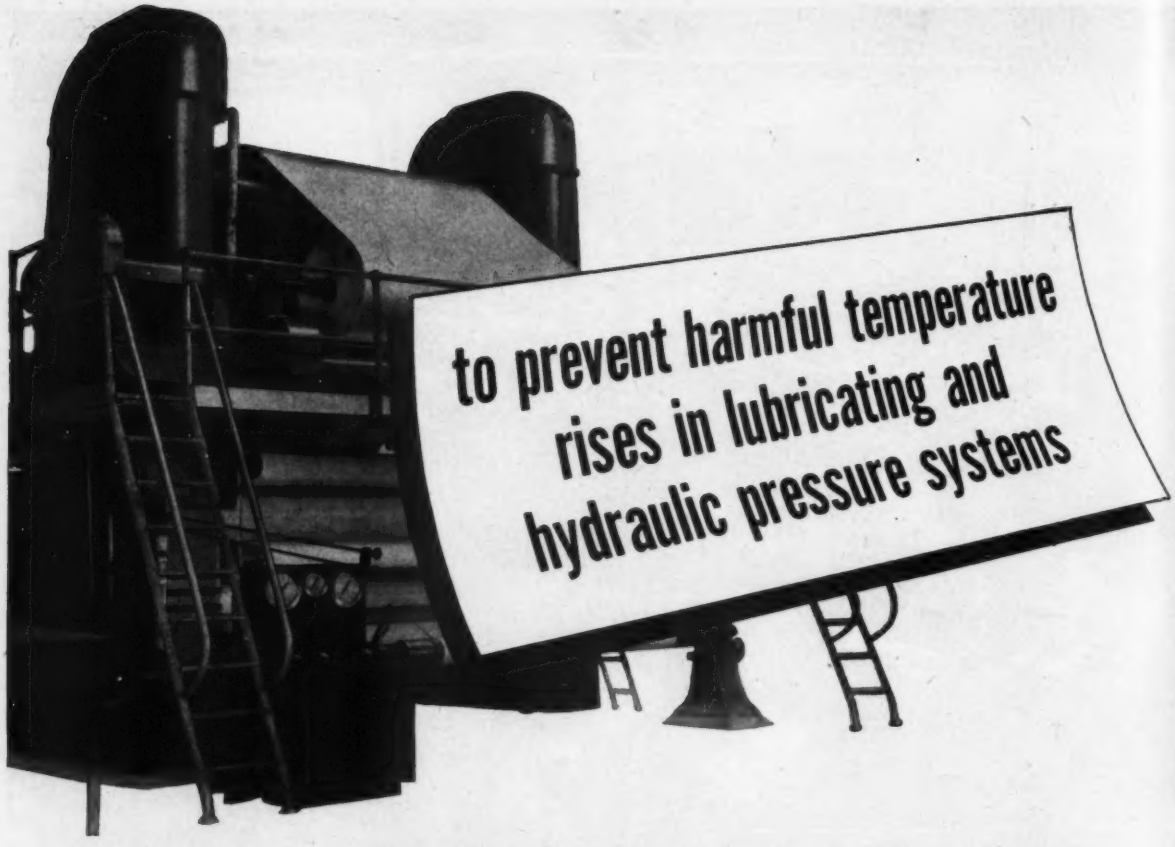

APPLETON SUPER CALENDERS ARE EQUIPPED WITH ROSS EXCHANGERS

Modern Appleton super calenders, like the one shown, must be able to maintain high productive capacity for prolonged periods. Operating and maintenance attention have to be at a minimum. There can be no unnecessary down time.

One way this is accomplished is through a precision controlled, oil hydraulic system that serves both to raise the rolls and apply the pressure. To assure constant pump capacity without slippage from overheated, thinned oil, a Ross Type BCF Exchanger is used. Temperatures are thus maintained at most effective levels.

Another way is by means of a self-contained, closed, circulatory lubrication system which also incorporates a Ross Type BCF Exchanger. Here again, temperatures are prohibited from running rampant and risking loss of vital lubricating properties.

Likewise, on many other types of Appleton paper and pulp mill machinery . . . rewinders, grinders, experimental super calenders, machine and embossing calenders . . . Ross Exchangers are called upon to meet similarly high requirements.

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The Paper Industry Names in the News

John Stevens Jr.

D. C. Everest

L. E. Croy

R. J. Sund

Stevens Succeeds Everest as Marathon President

JOHN STEVENS JR. has been named president of Marathon Corp., Rothschild, Wis., to succeed *D. C. EVEREST*. Mr. Everest had held the posts of both chairman and president since the resignation of William L. Keady.

The new president first joined the firm in 1929 and has been a vice president since 1932, a director since 1933. Mr. Stevens was in charge of constructing Marathon's $35,000,000 bleached sulphate plant in Canada and for the last several years has headed the firm's Canadian operations.

Mr. Everest retains the chairmanship and plans to share the responsibilities of management with Mr. Stevens.

Marathon also named *LEO E. CROY* and *ROY J. SUND* as executive vice presidents in charge of marketing and production activities, respectively. *FRANK J. DVORAK* was made vice president for finance.

Jay H. Price Honored by Society of Foresters

JAY H. PRICE of Milwaukee, regional forester for the North Central Region of the U.S. Forest Service, has been elected a fellow in the Society of American Foresters. He is one of 11 men who were so honored.

Mr. Price has directed activities in the nine-state North Central Region since 1939, coming to Milwaukee from San Francisco. For 11 years he has been one of the five members of the President's Quetico-Superior Committee, which has been successfully working for the preservation of the canoe wilderness on either side of a 200-mile stretch of the Minnesota-Ontario border. He has also served on the council of the SAF and that of the National Soil Conservation Society of America.

A native of California, Mr. Price was graduated from the University of California with a degree in mechanical engineering and worked as logging engineer for lumber companies in California and Panama before enlisting in the Army in 1917. He was later commissioned and served in France as company and operation commander with the 20th Engineers, a forestry regiment.

Entering the Forest Service in 1920 as a logging engineer, he became chief of fire control and state cooperation in the California region in 1926; in 1935 he was made associate regional forester at San Francisco.

Appleton Coated Paper Elects Officers

R. W. MAHONY, vice president and general manager of Appleton Coated Paper Co., Appleton, Wis., has been elected executive vice president and general manager. A president was not elected to fill the vacancy caused by the death of Charles S. Boyd in January.

Other officers elected include: *HERMAN B. BERGE*, vice president and manager of the Chicago division; *E. S. COLVIN*, vice president and sales manager; *JOHN P. REEVE*, vice president, assistant treasurer and mill manager; *M. D. WEYENBERG*, secretary, and *P. C. MENNING*, treasurer and assistant secretary.

APA Head Announces July Retirement

H. E. BRINCKERHOFF, executive secretary-treasurer of the American Pulpwood Association for the last 13 years, has announced that he would step down as acting head of the association on May 1, with his formal retirement slated for July. *W. S. BROMLEY*, APA forest-engineer for the last three years, was to assume active duties of the secretary-treasurer May 1, with Mr. Brinckerhoff serving in an advisory capacity. On July 1 Mr. Bromley is to become head of the association.

Mr. Brinckerhoff graduated from the School of Forestry at Cornell University in 1906. After a tenure of service in the advertising business, he filled a number of timber cruising posts both in the United States and Canada. After serving as a lieutenant overseas in World War I, he worked in the Montreal office of Canadian International Paper Co.; and on February 1, 1939, he succeeded William Good as secretary-treasurer of the APA.

A graduate of the Forestry School of Pennsylvania State College in 1938, Mr. Bromley took graduate work at the Yale Forestry School. Prior to his service with APA, he was a consulting forester, managed a 2,000-acre timber tract, served on the faculty at the University of Michigan Forestry School, and conducted research for two years at Michigan on logging practices and timber utilization.

H. E. Brinckerhoff

V. C. Gault

V. C. GAULT, of Camas, Wash., has been appointed general safety supervisor of Crown Zellerbach Corp. Announcement has been made in anticipation of the scheduled retirement of Otto R. Hartwig of Portland, Ore., on July 1. Mr. Gault is currently industrial and community relations supervisor at the Camas Division. He has been with the firm 35 years. It is planned that he will be relieved of active duties at Camas in order that he may undertake special assignments required by his new position.

H. C. Moore Named Beloit Iron Works President

At a recent meeting of the board of directors of Beloit Iron Works, Beloit, Wis., *HARRY C. MOORE* was named

NEWLY PROMOTED officials of the Pulp and Paper Division of Union Bag & Paper Corp.'s Savannah, Ga., plant confer shortly after their appointment. They are (l to r): W. C. Chapman, mill technical department superintendent; G. C. Kimble, assistant technical director; A. S. Farragut, pulp mill superintendent; J. R. Lientz, Pulp and Paper Division manager; H. Y. Charbonnier, division assistant manager; T. C. Johnson, division general operating superintendent, and J. J. Ward, division power maintenance engineer

president. He succeeds *ELBERT H. NEESE*, who was elevated to chairman of the board.

Other officers, all reelected, named at the meeting are as follows: *C. E. MACKLEM*, vice president; *W. S. WOOD*, vice president; *LLOYD HORNBOSTEL*, vice president; *J. E. GOODWILLIE*, vice president, and *W. C. SMITH*, secretary.

H. C. Moore

E. H. Neese

Mr. Neese, who joined the firm in 1916 as vice president, was elected president in 1931. He will continue to be active in the management of the company. President Harry C. Moore became associated with Beloit Iron Works in 1936, was elected vice president in 1941. He also serves as president of Beloit Export Corp. Mr. Moore is a member of the paper machinery industry advisory committees for both NPA and OPS, and is president of the Pulp and Paper Machinery Association.

At a recent meeting of the board of directors of River Raisin Paper Co., Monroe, Mich., the following company officers were elected: *J. F. GRAY*, chairman of the board; *C. L. WOOD*, president; *J. W. WALTER*, vice president for finance and secretary-treasurer; *A. J. GOETZ*, executive vice president; *H. V. HODGE*, vice president for sales; *H. R. McGOVERN*, vice president for manufacturing; *A. W. SCHULTE*, general sales manager, and *W. M. PELLOT*, comptroller.

7 Promotions at Chain Belt

W. J. SPARLING has been appointed to fill the newly created position of vice president and manager of Milwaukee operations of Chain Belt Co. His appointment heads the list of seven organizational changes announced recently. Mr. Sparling, who has been with the company since 1928, will manage the three major Milwaukee divisions and the general manufacturing department. He has been vice president and manager of the chain and transmission division.

M. G. JEWETT, chief engineer of the chain and transmission division, has been promoted to manager of that division. *B. F. DEVINE*, vice president and manager of the construction machinery division, will become a staff officer of the company and serve in an advisory and consulting capacity. *A. K. TOMAS*, who has been eastern sales manager since 1947, has been made manager of the construction machinery division. *J. W. LENDVED*, who has been appointed director of engineering in the construction machinery division, had been that division's chief engineer since 1940. *W. A. CLAYTON*, eastern regional sales manager for the construction machinery division, has been made division sales manager. *W. C. MESSINGER*, manager of the ordnance division, was elected an assistant secretary.

LAWSON P. TURCOTTE, president of Puget Sound Pulp & Timber Co., has been named a director of the National Association of Manufacturers.

Central Ohio Paper Co. has recently announced changes in the top management. *ROLAND W. MILLER*, former vice president, has moved up to the presidency, succeeding his brother, *ALBERT M. MILLER*, who becomes chairman of the board. *JEROME F. PAGE* was elected executive vice president; *ALBERT F. MILLER* is secretary. Continuing as vice president and general manager of the Toledo Division is *W. H. WALKER*.

Appointment of *JAMES SOUTHON* and *MORRIS KANE* to new positions has been announced by Kalamazoo Vegetable Parchment Co. They will carry on the work formerly done by the late Joseph B. Kindleberger in the field of market research and product development. Mr. Southon, who has been in charge of sales promotion, will enlarge the scope of his work to include market research. Mr. Kane has been named technical director of the KVP laboratory. In that position he will be responsible not only for routine testing and quality control but will also direct the activities of research men in development work.

NORMAN BARDEEN, former vice president for sales of Lee Paper Co., Vicksburg, Mich., has been advanced to a full vice presidency. At the same time, *A. A. CHRISTIAN* was named controller.

EDWARD H. NIEDERAUER, assistant manager and vice president of Escanaba Paper Co., has been elected chairman of the Escanaba City Planning Commission.

GROVER J. DALY, formerly a packaging engineer with Container Corp. of America, has joined Ottawa River Paper Co., Toledo, Ohio, as chief packaging engineer. He succeeds Pat Foy, who has been named sales representative for the company in Detroit.

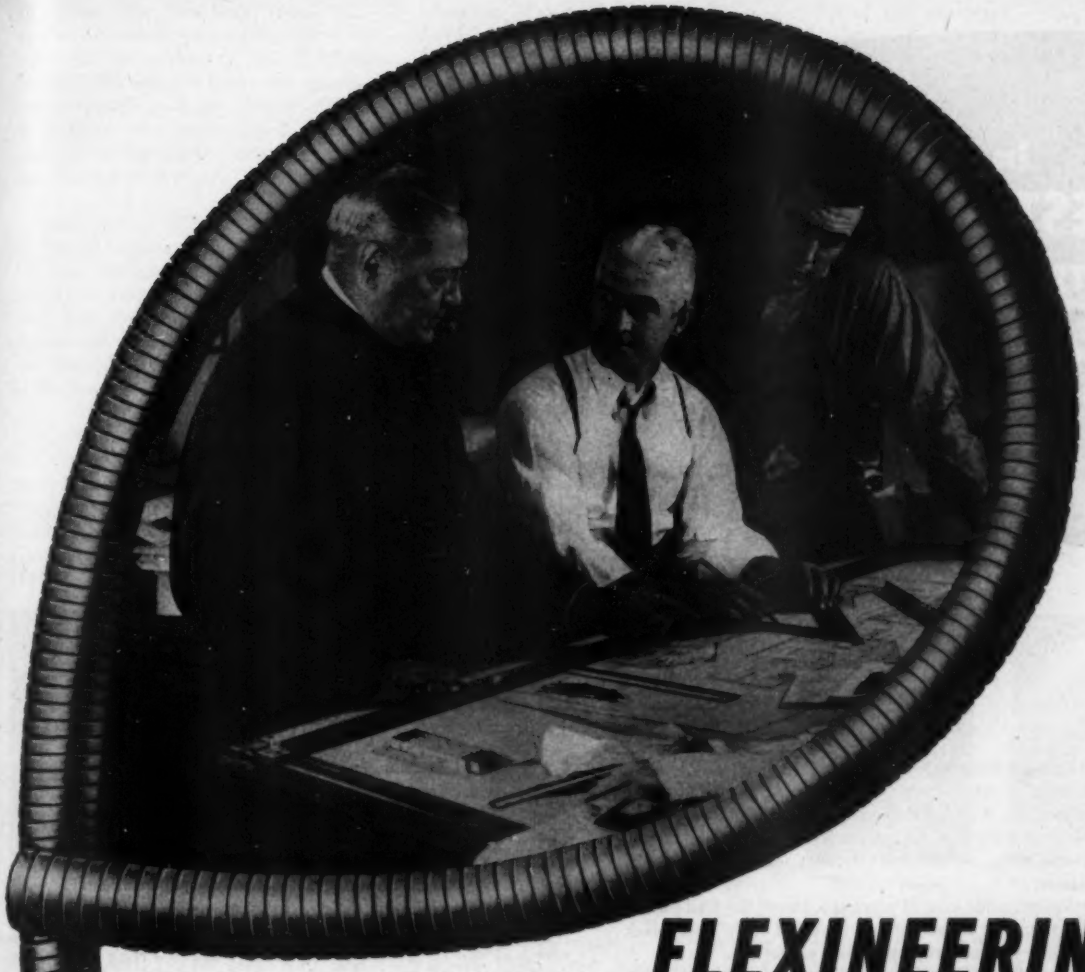
WILLIAM A. ZONNER, for the past 3½ years an official of St. Regis Paper Co., has been made executive vice president of Bagley & Sewall Co.

WILLIAM R. ADAMS, vice president in charge of all pulp and paper manufacturing, has been elected to fill a vacancy on the board of directors of St. Regis Paper Co. He joined the firm in 1937 and was made a vice president in 1948.

W. R. Adams

W. N. Dulaney

WILLIAM N. DULANEY, a representative in the Industrial Sales Department of A. E. Staley Mfg. Co., Decatur,



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◀ *Western Precipitation is able to give you an unbiased recommendation on your recovery requirements, for in addition to leadership in the electrical recovery field—Western Precipitation also leads in the mechanical recovery field with its widely-known* MULTICLONE *Mechanical Collectors. Western Precipitation installed the first MgO plant.*

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Except for its wholly-owned subsidiaries, The Precipitation Corporation of Canada and The International Precipitation Corporation, Western Precipitation Corporation is not affiliated, either directly or indirectly, with any other organization in the electrical or mechanical recovery field.

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Ill., since 1940, has been named manager of the southeastern sales office. His office will be at Atlanta, Ga. *DANIEL S. MILLER*, who has been supervisor for the company's package sales department in Atlanta, has been named assistant manager of the office in charge of package product sales.

WILLIAM J. ALFORD III, president of Alford Cartons, Ridgefield Park, N.J., has been elected deputy chairman of the board of directors of Thames Board Mills Ltd., Purfleet, England, largest producers and converters of paperboard in the British Isles and one of the largest in the world.

WARREN KEIFER, a recent graduate of New Mexico University, has been named director of publications of Kalamazoo Vegetable Parchment Co., Parchment, Mich., and editor of the *Parchment News*. He succeeds Malcom ("Max") Hunger, resigned.

president of Van Reekum Paper Inc.; *JOHN H. NEWMAN*, vice president of Parsons & Whittemore Inc., was named secretary-treasurer.

JOHN A. SUMMERLIN, Springfield, Mass., has been made assistant sales manager of Westfield River Paper Co., Inc., Russell, and its subsidiary, Glassine Paper Co., West Conshohocken, Pa.

HARRY RECHER has been made assistant to the vice president in charge of bag and paper sales for Union Bag & Paper Corp. He was previously a field representative for multiwall bag sales.

Black-Clawson Co. has announced the appointment of *FRITS MADSEN* as sales manager of B-C International Ltd., British subsidiary of Black-Clawson in London. He was formerly general superintendent of the Ny Maglemalle mill of DeForenede Papirfabrikker in Denmark.

They are *MANUEL C. McDONALD*, president of Great Northern Paper Co., and *ARTHUR G. WAKEMAN*, executive vice president of Coosa River Newsprint Co.

JACK E. MEADOWS, 35-year-old assistant manager of Crossett Paper Mills, has been named Arkansas' outstanding young man of the year by the Arkansas Junior Chamber of Commerce. He was presented a distinguished service award for "inspiring enthusiasm and loyalty to the State of Arkansas."

BERNARD J. SHIELDS has been promoted from staff engineer to the position of assistant to the chief engineer of Minnesota & Ontario Paper Co. He will assist J. H. Davidson, who is responsible for the centralization and supervision of all engineering functions at Mando's three mills in Kenora and Fort Frances, Ont., and International Falls, Minn.

R. H. Morrill

R. S. Benner

H. A. Downing

F. E. Newton

William Mazer

Joseph Mazer

RALPH H. MORRILL has been elected president and general manager of both Chemical Paper Mfg. Co. and Crocker-McElwain Co. At the same time, *RICHARD S. BENNER* was made treasurer of both firms. The late Joseph E. Holmes of Springfield, Mass., had been president and treasurer of the two concerns. Mr. Morrill joined Crocker-McElwain in 1912 as a bookkeeper and was elected a director, vice president and general manager in 1939.

HARVEY P. HOOD and *JOHN M. KINGSLEY* have been elected to the board of directors of International Paper Co. to fill existing vacancies. Mr. Hood is president of H. P. Hood & Sons, Boston dairy; Mr. Kingsley, a resident of Greenwich, Conn., is associated with Henry Phipps Estates.

HARRY R. RUSSELL has been elected a director and promoted to vice president of Wolf Detroit Envelope Co.

FRED C. STRYPE JR., secretary of F. C. Strype Inc., New York, N.Y., has been elected president of United States Paper Exporters Council Inc. He succeeds George V. Johnson, secretary of Elof Hansson Inc. Elected vice president was *JOSEPH V. CARENA*, executive vice

HUBERT A. DOWNING is the newly appointed manager of the Fort Niagara Corrugated Box Division of Robert Gair Co., Inc., at North Tonawanda, N.Y. He joined the firm in 1923 at the Thames River, Conn., plant as a machine helper. Mr. Downing succeeds Edward V. Patrician, who died in February. *FRANK E. NEWTON* has been made manager at Gair's Ohio Corrugated Box Division in Cleveland. He has been sales manager at Boston since 1943.

DAVID WADLEIGH has joined Scott Paper Co.'s engineering staff at its Soundview Division in Everett, Wash.

G. H. GALLAWAY, resident manager at Carthage, N.Y., for Crown Zellerbach Corp., has been transferred to Camas, Wash., where he is to be assistant resident manager. Frank Drumb is Camas manager. In another C-Z managerial change, *BEVERLY C. SMITH*, assistant resident manager at the Port Townsend, Wash., kraft mill, has been made manager of the Lebanon, Ore., plant.

Newsprint Service Bureau has announced the election of two directors.

WILLIAM and *JOSEPH MAZER* of Hudson Pulp & Paper Co. were to be honored May 13 at a testimonial dinner sponsored by the Paper, Paper Boxes and Allied Trades Division of the United Jewish Appeal of Greater New York. The gathering in recognition of the brothers' philanthropic and civic services was to be held at the Hotel Plaza, New York, N.Y.

E. C. REID has been elected president and *PETER FREEDMAN* named vice chairman of the board of American Writing Paper Corp.

ELMO B. STEVENS, manager of personnel at Hollingsworth & Whitney Co.'s Northern Mills, has been promoted to the position of assistant manager Northern Mills in charge of personnel.

GEORGE S. HERBERT has been made assistant general manager of Midwest-Fulton Machine Co., Dayton, Ohio. Associated with the firm for five years, he was formerly assistant treasurer.

J. EBERT BUTTERWORTH has been elected president of H. W. Butterworth & Sons Co., Bethayers, Pa., to succeed *HARRY W. BUTTER-*

261 YEARS CONTINUOUS SERVICE with Crystal Tissue Co., Middletown, Ohio, is represented in the above group. Awarding 25-year service watches to eight employees are E. E. Grant, president (left), and J. L. Long, vice president (right). The new 25-year men are (l to r): Harold H. Whitesell Sr., converting department; Harold R. Hall, back tender; Bennett Williams, machine tender; Cecil Staten, machine tender; Gary A. Williams, janitor; Kenduall B. Shaffer, machine tender; Edward J. Hiner, chief electrician, and Leonard C. Reed, night watchman.

WORTH JR., who became chairman of the board. J. E. Butterworth has been vice president and secretary of the firm and has handled export sales.

Newton Falls Paper Mill, Inc., has announced the election of *EDWIN S. WILSEY* as chairman of the board and *RONALD W. HYNES* as president and general manager. Other officers elected included *CURTIS W. McGRAW* and *JOSEPH S. HILDRETH*, vice presidents; *JOSEPH A. GERARDI*, secretary, and *A. M. ROSS*, vice president in charge of woodlands and mining operations.

River Raisin Paper Co. has announced the election of *J. W. WALTER* as vice president for finance. He continues as secretary-treasurer. *A. J. GOETZ* was elected executive vice president; *H. V. HODGE*, sales vice president, and *H. R. McGOVERN*, manufacturing vice president.

WILLIAM F. PFIEFFER, secretary and treasurer of Hinde & Dauch Paper Co. since 1937, has been named ranking vice president. Other changes recently announced by the firm include the promotion of *W. E. RICHARDSON* from assistant secretary to secretary; *L. R. WENDT*, from assistant treasurer to secretary-insurance, and *G. M. MUEHLHAUSER JR.* from assistant treasurer to treasurer.

DR. LAURISTON C. MARSHALL has been appointed director of Link-Belt Co.'s new physical testing and research laboratory at Indianapolis. He will be responsible for the continuing investigation into ways and means of improving production methods and the quality of conveyor and power transmission products developed by Link-Belt.

D. W. AMBRIDGE, president of Abitibi Power & Paper Co. Ltd., has been re-elected a board member of the National Industrial Conference Board for a term of one year. His election was announced at the group's 331st meeting held April 17 at Waldorf-Astoria Hotel, New York, N.Y.

G. EDWARD BEST has been appointed director of sales for Canada Sand Papers Ltd., Preston, Ont., manufacturers of coated abrasives.

ARTHUR E. POOLE has been appointed sales manager of the Filtration Fabrics Division of Filtration Engineers Inc., Newark, N.J. Prior to his association with Filtration Engineers, he was general sales manager of the Chemical Equipment Division of General Ceramics Co.

JOHN F. BUTTERWORTH, formerly with the chemical products group, Socony-Vacuum Oil Co., Inc., has been advanced to the Lubrite Division, St. Louis, where he will be responsible for the sales and service of process products, including those for the paper industry, in five states. He is a member of Tappi. Mr. Butterworth is being succeeded in New York by *WARREN S. KUMBLAD* of the New England Division.

A. P. RICHARDS has been chosen president and director of the laboratories for William F. Clapp Laboratories, Inc., Duxbury, Mass. He succeeds the late Dr. William F. Clapp, who died in December.

DR. JOSEPH L. McCARTHY, director of the chemical engineering division for pulp mill research at the University of Washington, Seattle, has been elected chairman of the division of cellulose chemistry of the American Chemical Society.

LLOYD E. KELLY of New York, N. Y., manager of eastern sales for the pigments department of E. I. duPont de Nemours & Co., Wilmington, Del., was to retire February 1 after 30 years with the firm. He is to be succeeded by *WALTER J. BEASTEN*, a pigments salesman in the Philadelphia office.

Appleton Woolen Mills, Appleton, Wis., has announced two field appointments. *P. H. ("Bud") FIELDS*, for 25 years associated with the southern pulp and paper industry, is to represent the firm in the southern states. *CLIFFORD GOLDMAN*, for the past eight years with another felt manufacturer, will be the Midwest representative.

BERLE BABLER, with 10 years' experience in the chemistry of the paper industry, has been made technical director of Atlanta Paper Co., Atlanta, Ga.

A. G. NATWICK, assistant resident manager for Crown Zellerbach Corp. at Camas, Wash., was to take over his new duties with the pulp division of NPA in mid-February.

Eastwood - Neally Corp., Belleville, N.J., has announced the retirement of *HARRY G. SPECHT* as vice president and director, effective March 11.

A. E. Staley Mfg. Co., Decatur, Ill., has announced two executive promotions in the corn division. *IVAN F. WIELAND*, assistant manager of the division's sales department, has been promoted to the newly created position of assistant to the corn division manager. *RICHARD L. NAGLE*, who has been

J. F. Butterworth

W. S. Kumblad

I. F. Wieland

R. L. Nagle

HAM FELTZ says:

Cushioned knuckles

leave no scars...

The open spaces between strands of a papermaker's felt are easily seen by the naked eyes when the woven fabric is removed from the loom. They vary in size and shape according to the pattern of the weave—large holes for high speed machines, smaller holes for low speeds.

When the fabric has been shrunk, fulled and napped, the pattern of the weave is cushioned. It can't leave its imprint upon the sheet that is formed on it. But the open spaces remain open—to carry off the water that is squeezed out by the press.

You will get a lot of tonnage from every Hamilton Felt if you use ordinary care to keep it clean but you will save money by changing felts before the "knuckles" begin to leave their marks.

Hamilton Felts

From the thinnest tissue to the heaviest board, there is a Hamilton Felt that will do your work without leaving felt marks in your sheet.

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SHULER & BENNINGHOFEN, HAMILTON, OHIO

Get Better Results Than Ever Before with
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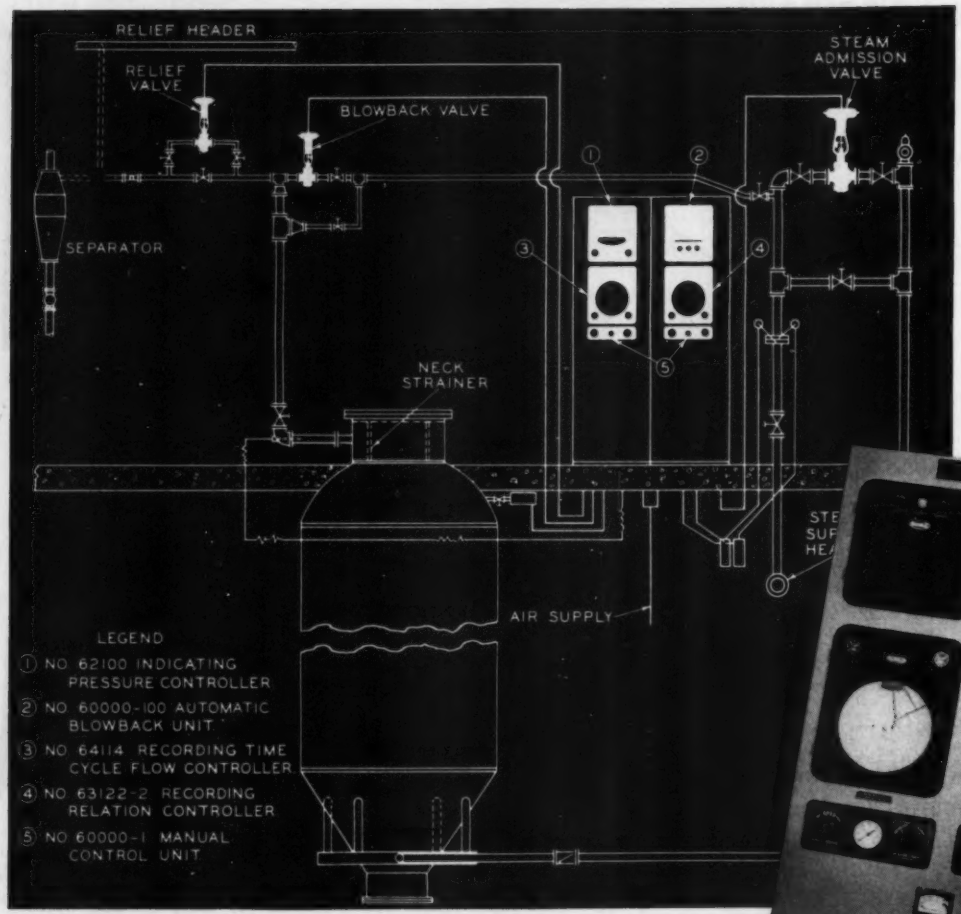

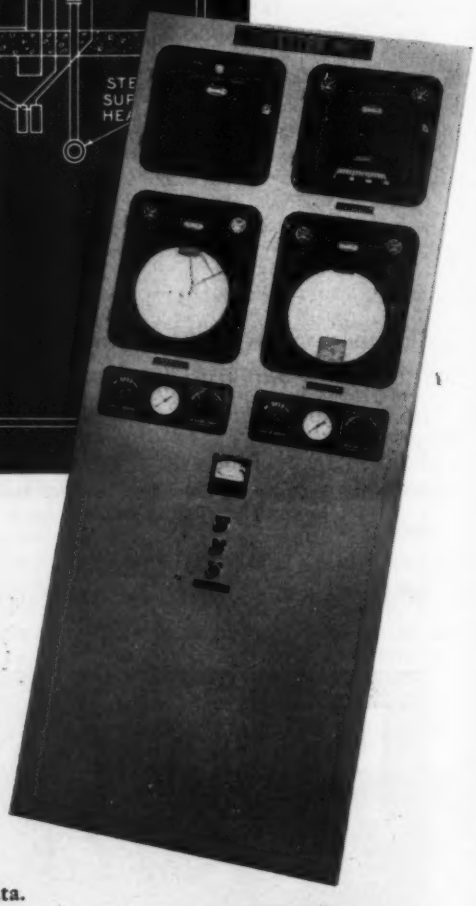

This Masoneilan system, which combines program control of steam admission, pressure-temperature relation control and automatic relief, is demonstrating substantial economies in many installations. Increased production (with fewer rejects) is the result of . . .

- **More Uniform Pulp—and often Increased Tonnage**
- **Better Bleachability**
- **Reduced Chemical Consumption**
- **Reduced Liquor Carry-over**
- **Lower Steam Consumption — and Graduated Demand on Power Plant**

If you are not fully informed on the advantages of this Masoneilan system we suggest that you ask for complete data.

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manager of co-products sales in the industrial sales department, has been named industrial sales manager.

WOLFE C. GIGLER has been appointed production superintendent of the new Crown Zellerbach Corp. converting plant now under construction at San Leandro, Cal. He has been superintendent of the converting plant at the firm's paper mill in Camas, Wash., since August of last year.

W. C. Gigler

J. A. Downes

JOHN A. DOWNES, Philadelphia representative for Stocker Mfg. Co., Netcong, N.J., has been elected 1952 president of the Philadelphia Paper & Cordage Association.

Tri-Clover Machine Co. has announced the following organizational changes in the sales department: *TODD LaROSE,* formerly West Coast representative, has been made general sales manager; *JAMES L. COSTIGAN,* assistant sales manager, has been named sales manager; *SIDNEY F. GREENWOOD* has been made assistant sales manager, and *ROBERT L. NISSEN* has been employed as advertising and promotion manager.

STEPHEN A. KELLER has been named general manager of the Valve Division of Minneapolis - Honeywell Regulator Co. He succeeds James H. Binger, who will continue as vice president of the division.

J. ROBERT SIMPSON III has joined J. R. Simpson & Co., Chicago representatives for Conoflow Corp., as a partner. He was previously a sales representative for Conoflow.

DAVID I. EDWARDS, vice president and director of Perkins-Goodwin Co., New York, N. Y., retired recently because of ill health. He joined the firm in 1916 as an office boy.

JOHN P. GLEDHILL, vice president in charge of sales for Aluminum Rolling Mills Ltd., Montreal, has been elected president of the Canadian Packaging Association.

PAUL E. PICKER, DAVID E. TAYLOR, MRS. EMMA MADDUX, and *MRS. MARGUERITE HART* recently received gold watches in recognition of 35 years' service with Harvey Paper Products Co., Sturgis, Mich.

MAYNARD W. McMILLAN has been made representative for the Baker Industrial Truck Division of Baker-Raulang Co. in the southwestern Ohio territory. A member of the sales administration staff since 1940, he will headquarter in Cincinnati.

M. W. McMillan

Harold Francis

HAROLD FRANCIS has been elected a vice president and has also been appointed general sales manager for the Eastern Division of Corn Products Sales Co., New York, N.Y. He began his career with the firm in 1914. Early in 1945 he was made branch manager of the Chicago office and two years later came to New York as assistant division manager.

CLYDE R. POORE has been named assistant sales engineer at Charlotte, N. C., for Permutit Co.

EDWARD J. SULLIVAN has joined the sales staff of Geo. W. Millar & Co., Inc., New York, N. Y. Since August 1 he has been a chief of the fine and printing paper section, Pulp, Paper and Paperboard Div. of the National Production Authority.

NORMAN M. GODFREY has been appointed manager of the eastern sales division of Hewitt-Robins Inc. He joined the firm in 1937 as a draftsman and served for a time as manager of vibrating equipment sales and development.

ALBERT E. FORSTER has been elected a vice president and member of the executive committee of Hercules Powder Co., Wilmington, Del. Succeeding Mr. Forster as general manager of the naval stores department is *PAUL MAYFIELD.*

W. B. HUNT JR., formerly with Armco Steel Corp. and Standard Oil Co. of Kentucky, has been appointed a sales representative for Gardner Board & Carton Co., Middletown, Ohio.

EDWARD McSWEENEY will serve as chairman of the Paper and Graphic Arts Division of the 1952 New York Heart Fund Campaign. Mr. McSweeney is treasurer of Perkins-Goodwin Co. and a director of McFadden Publications, Taunton Pearl Works, Southland Paper Mills Inc., Reed-Jones Inc., and Bard College.

JAMES H. PERRY, pulpstone sales engineer for Norton Co., Worcester, Mass., has been made secretary of the groundwood pulp committee of Tappi.

J. H. Perry

D. A. Herrick

D. A. HERRICK has been appointed Cleveland divisional sales manager for Ohio Injector Co., succeeding W. G. Shephard, who has been moved to Chicago to supervise the central division. Mr. Herrick has been with the valve manufacturing firm for eight years.

BRYAN L. RAUSCHERT has been appointed assistant resident manager of the Grays Harbor, Wash., division of Rayonier, Inc. He was formerly resident engineer of Rayonier's Port Angeles, Wash., division.

PAUL W. JOHNSON has been named assistant superintendent of the Bird & Son, Inc., felt mill at Phillipsdale, R.I. He succeeds Rexford H. Salisbury who retired recently.

HENRY RUST has been appointed division manager of the Robert Gair Co., Inc., plant at Bogota, N.J. Prior to his present appointment he was sales manager of Gair's solid fibre department at Montville, Conn.

CARL J. BERGENDAHL has left Pagel, Horton & Co., New York, N. Y., wood pulp importers, to become managing director of Hafrestroms A. B., pulp and paper mills at Haverud, Sweden.

F. H. HEY has been elected vice president of Sun Chemical Corp. He was previously general manager of the firm's Electro-Technical Products Div.

R. CHESTER REED of the Texas Co., New York, N. Y., has been appointed chairman of the program committee for the Fourteenth Annual Forum of the Packaging Institute, which is to be held in New York, October 20-22.

CUT THE COST OF CORROSION RESISTANT PIPING!

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WOOD-LINED STEEL PIPE

In use since 1930 wherever corrosion, abrasion, frictional resistance or sliming is a problem.

Combines the strength of steel with the durability of wood for economical, trouble-free service. Ideal for corrosive liquids, gases and fumes including process waters, industrial waste liquors, pulps, slurries, acid, alkali and salt solutions.

For service up to 180°F and 250 p.s.i. Higher pressure ratings for special service requirements. All pipe flanged and available in 10' and 20' standard lengths or "tailor-made" to your specifications. Easy to cut and re-flange. All flanges have standard ASME bolt circle.

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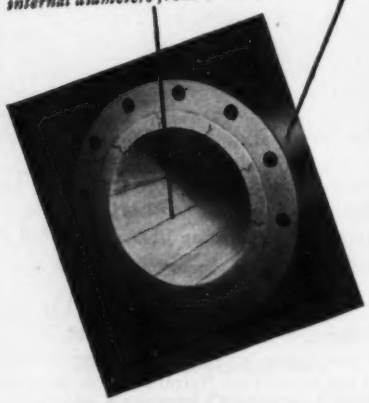
wall thicknesses 5/64" to 1/4"

INNER WOOD LINING
internal diameters from 4" to 40"



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The Paper Industry Necrology

Frank B. Whiting

Long influential in Wisconsin's paper industry, *Frank B. Whiting*, 66, of Neenah died March 30 while vacationing at Buenos Aires, Argentina.

Mr. Whiting, the adopted son of one of the state's pioneer paper industrialists, the late George A. Whiting, was chairman of the board of Whiting-Plover Paper Co., Stevens Point, and president of George A. Whiting Paper Co., Menasha. He began working for his father's firm at Menasha in 1911, doing ordinary labor. When his father died in 1930, he entered the management of the company and the following year was elected president and treasurer. In 1938 he became chairman of the board of Whiting-Plover, with control over several original Whiting interests. In 1950 he promoted his son, George A., to the position of president of the Stevens Point mill.

Joseph S. Scheuermann

For 25 years associated with allied industries, *Joseph S. Scheuermann*, 56, died April 3 at his home in Manhasset, N.Y. For the past two years he had been vice president in charge of the converting machinery division of Bagley & Sewall Co. His resignation from that position was to have become effective April 15.

J. S. Scheuermann

Mr. Scheuermann was born and schooled in Scranton, Pa. He was a well-known figure in the paper machinery industry, having been associated for 25 years with Cameron Machine Co. of Brooklyn, N.Y., where he was vice president in charge of sales before his affiliation with Bagley & Sewall.

Leon L. McGrady, 58, manager of the cellulose products sales division of Eastman Kodak Co., Rochester, N.Y., died April 4.

Oliver G. Bauman, 67, president of R. H. Thompson Paper Co., Buffalo, N.Y., died March 8.

John F. Halladay, 51, of Elkhart, Ind., a consultant in the papermaking, coating, and board converting fields, died March 27. He was with Container Corp. of America from 1929 to 1940, at which time he joined the staff of American Coating Mills in Elkhart. He became a consultant in 1946. Mr. Halladay was a member of both Tappi and the Superintendents Association.

Frederick Wallace, vice president of Fitchburg Paper Co., Fitchburg, Mass., died March 28 at Miami Beach, Fla. He was 71. Mr. Wallace was born in Fitchburg and joined the paper company soon after his graduation from Harvard in 1902.

Henry Seelman, 78, one of the founders of both George Seelman & Sons Co. and Milwaukee Envelope Co., died March 26. He was an officer and director of both concerns at the time of his death.

Harry E. Fick, 57, owner of Fick Paper Co., Chicago, died at his home March 17. He was a member of the Association of Commerce and the Paper Merchants Association.

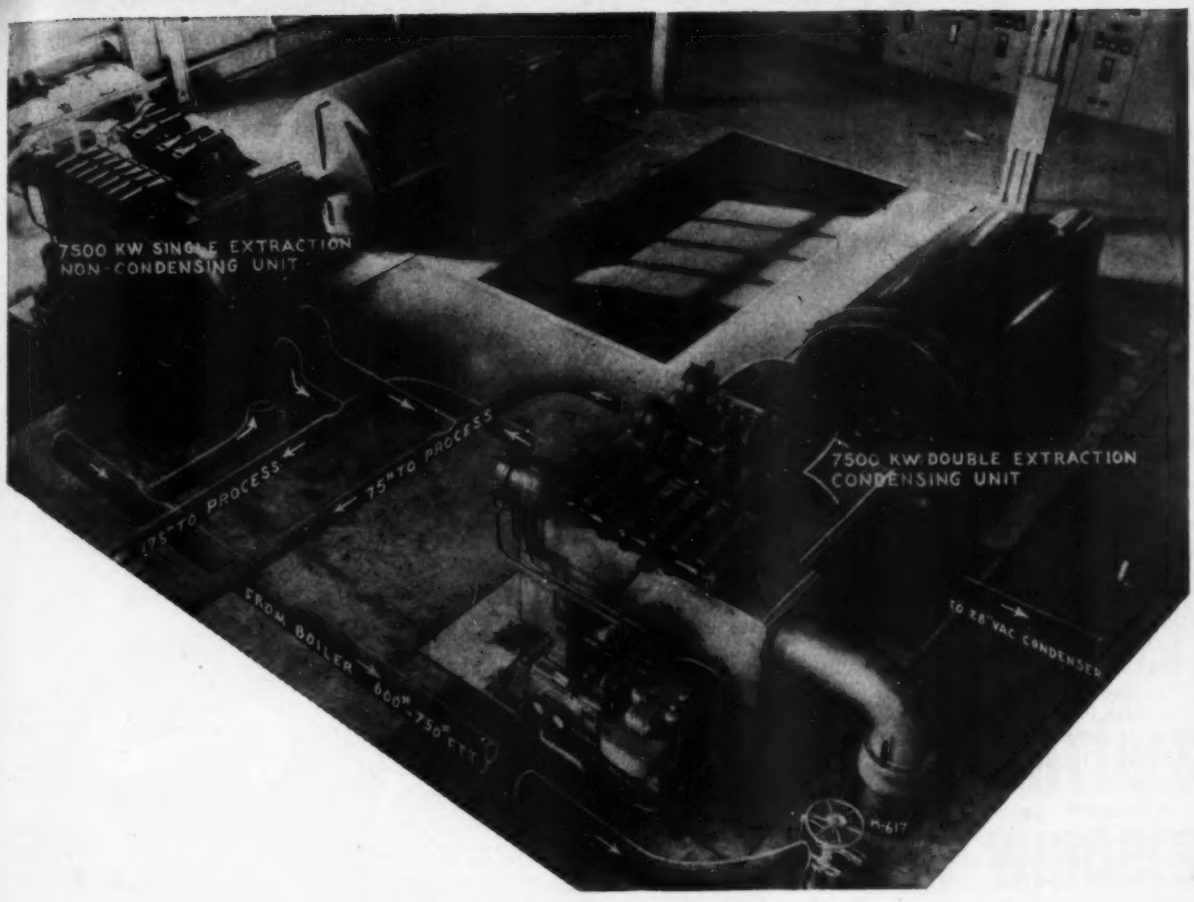
LeRoy M. Gardner of Rumford, R.I., president of R. L. Greene Paper Co. in Providence for the past 26 years, died March 16.

Frank Grote Sr., stationary engineer for Fox Paper Co., Lockland, Ohio, for the past 18 years, died March 21 at his home. He was 68.

Myer Ginsburg, president of Statler Tissue Corp. of Somerville, Mass., died March 9. He was also treasurer of Consolidated Bag Co., Somerville, and was associated with Ginsburg Bros., Inc., paper products company, and Bancroft Paper Mills.

John B. Knight, 57, for many years a sales representative for George Irish Paper Co. and Alling & Cory Co., Buffalo, N. Y., died January 20 in a Buffalo hospital.

Charles H. Stein, retired employee of Hinde & Dauch Paper Co., died at his home in Sandusky, Ohio, February 3.



Process Steam Maintained at 2 Pressures

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This is how Worthington and a Far West cellulose mill set up the steam supply for utmost efficiency and flexibility.

We combined a non-condensing single automatic extraction unit with a condensing double automatic extraction unit. The 7500-kw units operate in parallel and, in addition to supplying plant power, furnish steam at two pressures for process requirements.

Along with the advantages of efficient operation and low cost and ability to adjust to mill requirements, this mill benefits from the manufacturer's *unit responsibility*. In this case, Worthington also furnished two 470-hp turbines to drive boiler feed pumps, two 452-hp turbines to drive induced-draft fans, two 146-hp turbines to drive forced-draft fans, and one 50-kw turbine-driven exciter set.

If you want proof *there's more worth in Worthington*, write Worthington Corporation, formerly Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, New York.

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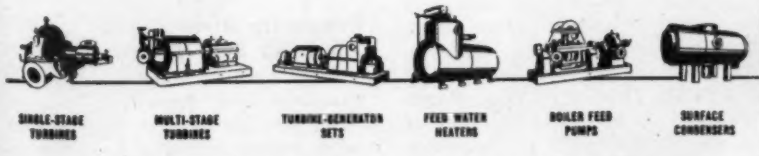

A GREAT TEAM IN STEAM

WORTHINGTON

Steam Turbine Generators

The Paper Industry Safety News

Awards Made During Southern Safety Association Meeting

Achievement awards and certificates were presented to six mills and converting plants recently at the Ninth Annual Meeting of the Southern Pulp and Paper Safety Association. The gathering was at the Dixie Sherman Hotel in Panama City, Fla., April 21-23. The program was in charge of J. W. Lowery Jr., safety director of the Panama City mill of International Paper Co.'s Southern Kraft Division.

For outstanding achievement in reduction of lost-time accidents, Hammond Bag & Paper Co., Wellsburg, W. Va., won the trophy given annually by *Southern Pulp and Paper Manufacturer.* The award was accepted for Hammond by David V. Hill, safety director of the Mead Corp., Kingsport, Tenn.

Certificates for outstanding safety records were presented as follows: for pulp and paper mills—the Mead Corp., which had a perfect frequency rate for 1951; for woods operation—St. Regis Paper Co., Pensacola, and the Mead Corp.'s Heald Div., Lynchburg, Va.; for box plants—National Container Corp., Jacksonville, and for bag plants —Gulf States Paper Corp., Tuscaloosa, Ala. The awards were presented by Vincent F. Waters, editor of *Southern Pulp and Paper Manufacturer.*

NSC Executive Council Meets

A meeting of the Executive Committee of the National Safety Council's Pulp and Paper Section was held in conjunction with the general convention. With 22 committee members present, details of the program to be held during the annual Congress in Chicago in October were set forth and adopted. The meeting also included the presentation of committee reports and a clarification of the Section's activities in its relation to the Council.

Taking an important part in the committee meeting was H. B. Goodrich, general chairman of the Section. Mr. Goodrich is maintenance and safety engineer for Strathmore Paper Co., West Springfield, Mass. George McDonald represented the NSC.

Mill Visit

On the second day of the meeting, many of the delegates toured the sulphate pulp and paper mill of I.P. Co.'s Southern Kraft Div. Others participated in a fishing expedition on the bay.

Principal speaker at the annual banquet was Fred Smith, vice president for industrial relations of Wm. Powell Co. His topic was, "Human Relations and Safety." James E. Poston, assistant personnel director of I. P. Co.'s Panama City mill, was toastmaster.

Participants in a panel discussion of safety held during the meeting included Dallas E. Henry, Southern Advance Bag & Paper Co.; H. H. Chestnut, I. P. Co.; J. F. Turner, I. P. Co.; F. M. Hickey, U.S. Navy Mine Countermeasures Station; Mrs. Carmen Bishop, R.N., I. P. Co., and H. E. Newbury, Ecusta Paper Corp.

Dan Adair Succeeds Alley at National Safety Council

Dan Adair has succeeded Harold R. Alley as staff representative for the Pulp and Paper Section at the National Safety Council. According to an announcement from the Council, Mr. Alley resigned as of April 15.

Staff representative for the Wood Products Section since November 1950, Mr. Adair will now hold both positions. Prior to his joining the NSC staff, he was with the Department of Labor and Industries of the State of Washington, later serving as a consultant to the wood products industries of the Northwest.

Southern Safety Assoc. Shows Improvement in 1951 Rate

According to the accident frequency report for 1951 issued recently by the Southern Pulp & Paper Safety Association, member mills showed 1.37 per cent fewer injuries than in 1950. At the same time, the number of man-hours worked was up 6.8 per cent. The accident frequency rate for 1951 was 10.13, as contrasted to 11.03 in 1950.

Leader among member mills was Mead Corp.'s Nashville, Tenn., mill, which showed no disabling injuries in 239,169 man-hours of exposure. Second place went to Ecusta Paper Corp., Pisgah Forest, N.C., with a frequency rate of 1.4, while in third place was Brunswick Pulp & Paper Co., Brunswick, Ga., with a rate of 1.62.

While the frequency of bag plants is up over 1950, two additional plants are reporting, and hours worked were 3,713,107 greater. In this category, the 1951 figure was 12.12, compared to 7.43 for 1950. Tied for first place, each with frequency rates of 0.0, were Gulf States Paper Corp., Tuscaloosa, Ala., and Hudson Pulp & Paper Corp., Palatka, Fla.

In the box plants division members reported a frequency rate for 1951 of 9.39, a reduction of 26.4 per cent from 1950. National Container Corp.'s Southern Container Div., Jacksonville, Fla., led the list with a freqeuncy rate of 4.33. Second was Union Bag & Paper Corp., Savannah, Ga.

St. Regis Paper Co., Pensacola, Fla., led in the woods operation category, with a frequency rate of 0.0. Second, also with a 0.0 rate, was Mead Corp., Lynchburg, Va. The combined figures for all woods operations for member mills showed a 1951 rate of 49.29, up over the 1950 mark of 39.82.

"Gimmicks" Tell K-C Safety Story

"Accident prevention" instead of "safety" is the theme stressed by E. V. Johnson, safety director of Kimberly-Clark Corp., Neenah, Wis., as he tours the state as a speaker for the Wisconsin Council of Safety. In his experience, consisting of some 75 talks in less than three years. Mr. Johnson has come to rely on "gimmicks" to tell his story.

"I have a way of bringing home the point that even a remote chance of getting hurt is no reason for taking chances," he declared in a recent newspaper interview. "I offer a member of the audience, who says he doesn't mind taking a chance, a bottle of sugar pills. I tell him that one pill is deadly poison, but that there are so many pills in the bottle he has a small chance of being hurt. Does he take a pill? Not on your life!"

Important in getting his story across is Mr. Johnson's practice of allowing the audience to participate in the program. His theory is that if his listeners laugh with him they will think with him. He emphasizes the fact that safety cannot be sold with statistics. Too many people are content to let safety go by the boards, he has said, "if they think they have a very small chance of being hurt."

Racquette River Seeks 1,000,000 Safe Days

As of April 16, the safety record of Racquette River Paper Co., Potsdam, N.Y., was 310 days, or 936,000 man-hours worked without a lost-time accident. The goal of the 450 employees is 1,000,000 safe man-hours. That record was to have been reached May 6, bar-

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versatile

Sufficiently heavy to be used either as a Rewinder or as a Winder behind a paper or board Machine, Type "BA" is built in widths from 62" to 92" and to handle diameters up to 50", or on special orders, 60". Heavy cast iron bedplate and box section side frames, together with nitrided main drive gears, combine a long, maintenance-free operation with quality work. Various types of Drives are available—variable speed clutch and constant speed motor, variable speed motor, etc. Ask for Bulletin #204 giving details on this and other types.

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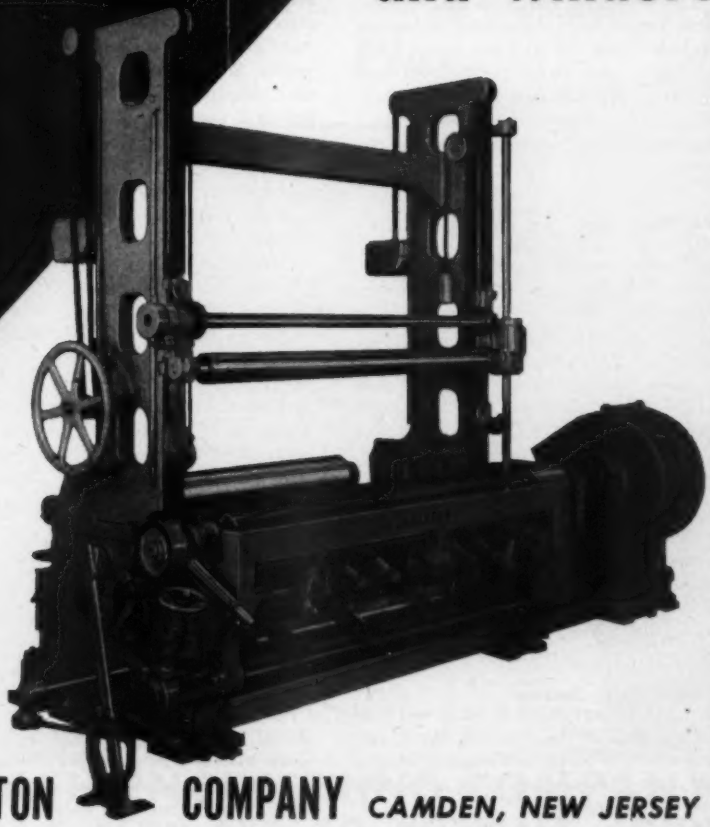

SAMUEL M. LANGSTON COMPANY CAMDEN, NEW JERSEY

FOR THE PULP MILL with the best safety record and lowest accident frequency rate for 1951, Safety Director E. Cowan of MacMillan & Bloedel (Alberni) Ltd., receives trophy from Paul E. Cooper, CPPA western division past chairman

GOLDEN TROPHY for the best team in the 1952 First Aid Competition of the Pulp and Paper Industry of British Columbia is presented to J. Cavers (right) of Alaska Pine and Cellulose Ltd. by Adam Bell, chairman of the Workmen's Compensation Board

ring accident. The current Racquette River mark surpasses the firm's previous record, which was established in June 1950, of 211 days and 618,000 man-hours.

The company has won an achievement award from Associated Industries of New York for its 1950 record, and a 100 per cent award for its 1951 record of 13 accident-free weeks. The National Safety Council has also awarded the firm an achievement certificate for 1950.

Marathon Corp.,
Menominee, Mich., recently celebrated 100 consecutive days since the last lost-time accident, which took place December 8, 1951. The plant's best record to date is 385 safe days, worked between December 6, 1948, and January 5, 1950. At that time, the Menominee plant was awarded first place for pulp and paper mills in Group C in the annual contest of the National Safety Council.

Current Winners
in Employers Mutuals safety award program include the following: Cornell Wood Products Co., Cornell, Wis.; Forsberg Paper Box Co., Madison, Wis., and Ward Paper Co., Merrill, Wis.

Pulp & Paper Section
of the National Safety Council will hold its meetings at the Sheraton Hotel during the 1952 National Congress, instead of at the Stevens (now the Conrad Hilton) as in past years.

Alaska Pine & Cellulose, MacMillan & Bloedel Win First Aid Awards

Alaska Pine & Cellulose Ltd. and MacMillan & Bloedel Ltd. were first place winners in the Fourth Annual First Aid Competition staged recently in Vancouver, B.C., by the Western Branch of the Canadian Pulp & Paper Association. British Columbia pulp and paper mills were eligible.

Recipient of the huge golden trophy as winner in the pulp and paper industry was the Port Alice first aid team of Alaska Pine & Cellulose Ltd. J. Cavers was captain of the group. Powell River Co. Ltd.'s team, captained by C. J. Baynton, took second honors.

Also presented were the two mill awards for the best primary and the best converter safety record during the past year. The primary award was presented to MacMillan & Bloedel (Alberni) Ltd. The converter shield went to Davies Paper Box Ltd., Vancouver, which had maintained a perfect accident record throughout the year.

Presentations were made by Adam Bell, chairman of the Workmen's Compensation Board, and by Paul E. Cooper, immediate past chairman of the executive committee of CPPA's western division.

According to a spokesman for the CPPA group, the safety record of British Columbia pulp and paper mills since 1940 is outstanding. For every six men suffering a permanent disability in 1940, there is only one today.

National Safety Council
has announced the availability of nine "package" safety programs. They are as follows: (1) Plant Housekeeping; (2) Handling Materials; (3) Eye Protection; (4) Fire Protection; (5) Personal Protective Equipment; (6) Machine Guards; (7) Hand Tools; (8) Falls, and (9) Maintaining Interest. Sample materials in these areas of hazard have been put together in envelopes with lists and price sheets.

Forest Service Safety Awards Presented

Certificates for outstanding safety records have been awarded six Forest Service regions and four forest and range experiment stations by Lyle F. Watts, chief of the U.S. Forest Service.

Special commendation was given the Forest Products Laboratory at Madison, Wis., for its record of no injuries in 1,250,000 man-hours worked during the past 21 months, and to the Allegheny National Forest in Pennsylvania for 65 months without a lost-time accident. The Northeastern Region, comprising 14 states from Maine to Kentucky, was cited for having only one lost-time injury last year.

Forest Service regions and stations reported a total of 543 lost-time accidents and eight deaths during the calendar year 1951. This is an increase of 35 injuries and six deaths over 1950. Reports on lost-time and minor injuries show that last year 291 persons were injured using small hand tools, the most common cause being the axe. Another 258 persons

were injured by falls, and 181 were injured moving supplies and equipment. Other accident causes included falling objects, motor vehicles, animals, burns, cave-ins, explosions, exposure, and infections. The eight fatalities were caused by motor vehicle accidents, heart attacks from overexertion, and fire fighting.

Other regions, in addition to the Northeastern, receiving certificates for meeting safety objectives are: Region 2 (Colorado, Wyoming, South Dakota, Nebraska, and Kansas); Region 4 (Utah, Nevada, and southern Idaho); Region 8 (the 11 states south of Virginia); Region 9 (Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, and North Dakota), and Region 10 (Alaska).

Forest and range experiment stations receiving awards are: Northeastern; Northwestern (Oregon and Washington); Northern Rocky Mountain (Montana, northern Idaho, northeastern Washington, and northwestern South Dakota), and Rocky Mountain (Colorado, Wyoming, South Dakota, Nebraska, and Kansas).

Oregon Safety Record Praised at Portland Meeting

Although industrial accidents in manufacturing plants throughout the United States have increased by 20 per cent in 1951 as compared to 1950, the pulp and paper mills of the state of Oregon have been able to maintain their lower-than-average accident frequency, according to Ivor D. Isaacson of Los Angeles. Mr. Isaacson, vice president of the International Brotherhood of Pulp, Sulphite, and Paper Mill Workers, addressed 85 labor and management delegates to the Sixth Annual Labor-Management Safety Conference of the Oregon pulp and paper industry, which was held March 13-14 at the Multnomah Hotel in Portland.

The program of safety conferences on the West Coast was originated in 1946 by the Pacific Coast Association of Pulp and Paper Manufacturers, the International Brotherhood of Pulp, Sulphite and Paper Mill Workers (AFL), and the International Brotherhood of Paper Makers (AFL). Since that date the accident frequency rate in Oregon mills has been reduced from 62 per 1,000,000 manhours to 8.38 in 1951.

Minnesota & Ontario Paper Co. is participating in an extensive first aid training program at its International Falls, Minn., mill. More than 60 supervisory and hourly employees are enrolled in the course, which is given in cooperation with the Red Cross. According to R. W. Croucher, Mando's safety officer, the instruction is now available to a majority of the employees.

10
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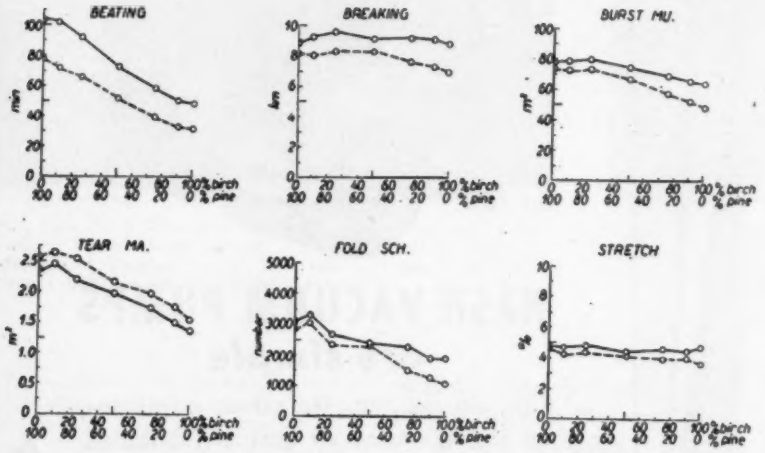
Foreign Abstracts . . . . . .

Fig. 1. (Table I. Series III.) Commercial pine sulphate pulp (Roe No. 8.s). Laboratory-produced birch sulphate pulp (Roe No 3.s).
——50°SR ----30°SR



Strength properties of birch-pine pulp mixtures

This is another contribution from the Institute of Wood Chemistry, Abo Akademi, Finland.

After a comprehensive study (results of which are shown in the series of graphs shown in Fig. 1), the author concludes that the addition of 10 per cent birch pulp to pine kraft causes a slight improvement in strength properties. No lowering in pulp quality occurs until about 20 per cent birch has been added. Waldemar Jensen. *Paper and Timber* (Finland). 33, 333-335 (1951). (In Swedish, with English summary and tables).

Red coloration of certain sulphite pulps

The work of Adler and Häggroth [*Svensk Papperstidn*, 53, 287 (1950)] is discussed favorably and then amplified. The author points out that in the case of unbleached sulphite pulps, red colorations emanate from the presence of small amounts of spent liquor, which are tenaciously retained by the pulp. The liquor, however, can be removed by continued washing. All these reddening reactions of a pulp are also reactions that are given by the liquor alone.

The red coloration given by glassine (Pergamyn papier) in the presence of air and sodium chloride is a corollary to the color given by unbleached pulps in the presence of oxidants. Only hard pulps give the sodium chloride reaction; soft pulps fail to give the coloration. In these "sodium chloride reddening colorations," sulphur dioxide plays a role. It serves to protect the spent liquor from air oxidation. However, in the presence of much sodium chloride, the solubility of sulphur dioxide in aqueous solutions is decreased, the protective action is also lowered, and red colorations are favored.

Cymene (often present in sulphite waste liquor) influences the reddening reaction. It serves to "activate" the oxygen of the air and plays a role similar to that of a peroxide. This was shown experimentally by means of colorless starch-iodide, which failed to give any blue coloration until cymene was added, whereupon the blue starch-iodine reaction resulted very rapidly. Similarly, if a bleached sulphite pulp is treated with sulphite waste liquor (free from cymene), no reddening takes place. With the addition of cymene, however, red spots occur on the pulp. Erwin Schmidt. *Svensk Papperstidn.*, 55, 134-138 (1952). (In German).

On the fundamental process of paper formation from wood

The author has compared the process termed "felting" (I) with that of fiber-bonding (II), and, in his opinion, paper formation and strength are due largely to II, in which the hemicelluloses (especially the polyuronides) serve as adhesives. To exclude I as completely as possible, the author prepared sheets in which the fibers were oriented in parallel. Pulping was effected very cautiously by subjecting a thin poplar veneer sheet (III) to a kraft cook, followed by careful washing and by a chlorite bleach, which reduced the lignin content (from the original 21.9 per cent) to 0.79 per cent. The resulting sheet (IV) (yield 53.5 per cent) contained 79.2 per cent cellulose, 20.0 per cent hemicelluloses and 1.45 per cent uronic anhydride (i.e., only about 15 per cent of that of III).

In producing IV, defibration did not occur and the original wood structure was kept almost intact, and its microstructure was surprisingly similar to that of III. The strength properties of IV were tested both with and without mild pressing and drying at about 95 deg. and the following properties obtained: tensile strengths were respectively 2750 and 4760 kg./cm.^{2}, the breaking lengths 34.2 and 44.1 kilometers, and the folding endurance numbers 11,300 and 4,250. These high values are ascribed to II of hemicelluloses in the (lignin-free) middle lamella and in the primary cell wall.

The author also defibered IV and then *with* and *without beating* formed a pulp sheet (V) which was dried in air, under 10 kg./cm.^{2} pressure in order to effect adequate bonding. The following properties were obtained with (beaten) V: tensile 1205 kg./cm.^{2}, breaking length 12,300 m., and fold 9870. Inasmuch as the strength characteristics of both IV and V were developed as a result of II, the author discards the term I and suggests the word net-formation (Vernetzung) when fiber shortening and fibrillation has occurred. 10 Photomicrographs and about 29 references are given. W. Klauditz. *Holzforschung*, 5, 58-67 (1951). (In German).

The heat treatment of wood fiberboards

The usual heat treatment, which improved the strength and water repelling properties of poplarwood board (I), causes a thermochemical modification in the hemicelluloses (especially the polyuronides), which contributes to the effective bonding of the fibers. By heating (2 hours at 170°) the tensile strength and resistance to bending of I improves, swelling is almost cut in half and water sorption is greatly decreased. On the other hand, the degree of polymerization of the cellulose in I drops (from 1600 in the original wood) to 610.

The beneficial effects of heat treatment was also found in I made from delignified poplar board. On the other hand, when paper sheets were made from lignin-free pulps and subsequently subjected to the usual heat treatment, their strength properties (especially folding endurance) dropped markedly. This is ascribed to the degradation (*e.g.*, lowered D.P.) of the cellulose. Heat treatment of I evidently causes loss of carbon dioxide, water and acetic acid, with a lowering in the "lignin" and uronic anhydride contents. W. Klauditz and G. Stegmann. *Holzforschung*, 5, 68-74 (1951). (In German).

Physical characteristics of alpha-, beta-, and gamma cellulose

Electron microscope evidence of holocellulose of spruce dispersed by ultrasonic radiation indicates that it contains two different components: micellar "strands" (cellulose) and a dispersed phase (hemicellulose). Similar micellar strands (about 80 A. in width)

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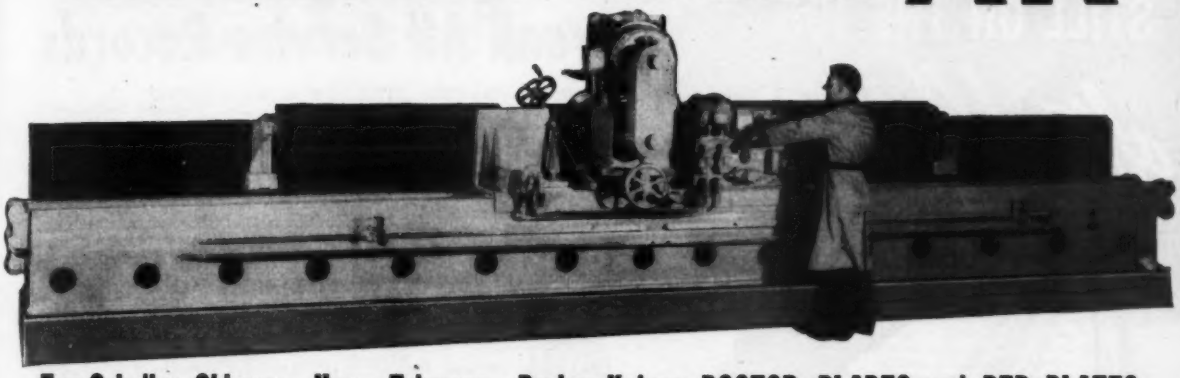

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were present in the alpha-cellulose of bleached technical coniferous pulps. The gamma fraction contained no such strings. The beta-cellulose fraction was evidently a mixture of short strands and very small particles.

An X-ray study showed that alpha- and beta-celluloses have the same lattice structure and contain mercerized cellulose ("Cellulose II"). The lattices of gamma-cellulose, isolated from sulphite or sulphate pulps, are quite similar to each other but very different from Cellulose II. The X-ray diagrams of two gamma fractions were compared, and whereas one such fraction may be a pure phase, the other is a mixture of this and (at least) one other phase. The beta fraction of coniferous pulps appears to be a partially depolymerized cellulose. (Holocellulose and kraft pulps contain little of the beta fraction.)

Fig. 1

Fig. 2

The physico-chemical data strongly support the view that the cellulose strands in spruce and pine form a pure phase, with a definite boundary to other carbohydrates [cf. Algar, Giertz and Gustafsson, *Svensk Papperstidn*, 54, 335 (1951)], whereas the gamma fraction is identical with the wood polyoses and with the amorphous interfibrillar substance in pulp. Fig. 1 shows holocellulose dispersed by ultra sonic radiation. Fig. 2 shows a gamma-cellulose isolated from a spruce rayon sulphite pulp. Bengt G. Ranby (Univ. Uppsala, Sweden). *Svensk Papperstidn.*, 55, 115-124 (1952). (In English; with 21 references).

Yellowing of paper

An orienting study. With nearly all rag halfstuffs, brightness improved with irradiation. Yellowing of wood pulps decreased with decreasing lignin content. Well bleached, wood pulps showed practically no yellowing even on extended irradiation. Unbleached pulps, on the other hand, showed marked yellowing with time. Bleached mechanical pulp rapidly loses brightness, even after a relatively brief period of irradiation. Fillers in paper may influence the rate of yellowing. The irradiations were carried out with the apparatus of Casella works, Frankfort. Erhard Liebert. *Allg. Papier Rundschau*, 93-4, 96-7 (1952). (In German).

Improving the copper number determination of pulps

A slight modification of the Wenzl procedure appears to give more reproducible results. To a 150 cc. Northrup or Lintner flask (which can be sealed with a screw clamp) are added 2.5 grams of air-dried shredded pulp and 50 cc. of the usual standard cop-

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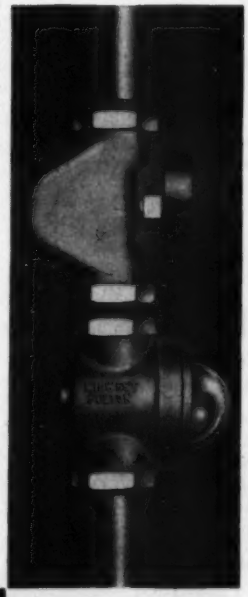

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per sulphate solution, *previously heated to boiling*. The flask is sealed, placed immediately in a boiling water bath, and kept there during exactly 0.5 hour. The contents are then poured promptly into cold water, filtered by suction, washed, and treated gradually with 100 cc. of a standard ferric sulphate solution, filtered, washed, and the ferrous sulphate in the filtrate titrated with 0.1 *N* potassium permanganate. The calculations are similar to those given previously [cf. Schwalbe and Sieber, *Chemische Betriebskontrolle in der Zellstoff u Papierindustrie*, 3rd Edition, p. 400, Berlin, Springer (1931)]. J. D. Pelgroms and L. Villers. *Papeterie*, 74, 87, 89, 91 (1952). (In French).

Tentative method for determining viscosity of cellulose

This is a report of work done by the analytical committee of the Central Laboratory of the Cellulose Industry. It involves the viscosity determined in cupriethylenediamine, details of which are furnished. The author discusses very fully the dimensions, use (for high accuracy) of the Wagner-Russel viscometer, shown in Fig. 1, or (for routine purposes) the pipet viscometers and dissolving flask shown in Fig. 2, their calibration, the preparation of solutions and reagents (and then analyses), the preparation of pulp samples, as well as the fully defined procedure and calculations.

The method (given in great detail) may be summarized as follows: the pulp is first defibrated in 25 ml. of water in a 50 ml. bottle, together with some pieces of metallic copper, and then dissolved by adding 25 ml. of 0.1 molar cupriethylene diamine solution and shaking 15 minutes. The viscosity determination is made in a Wagner-Russel viscometer (Fig. 1) at a velocity gradient of 200 sec.$^{-1}$, or in an ordinary pipet viscometer (Fig. 2). In the latter case, the viscosity values were recalculated to a velocity gradient of 200 sec.$^{-1}$ by means of an appropriate curve. Karin Wilson. *Svensk Papperstidn.*, 55, 125-132 (1952). (In English). (The techniques are also described in Swedish, pp. 132-133).

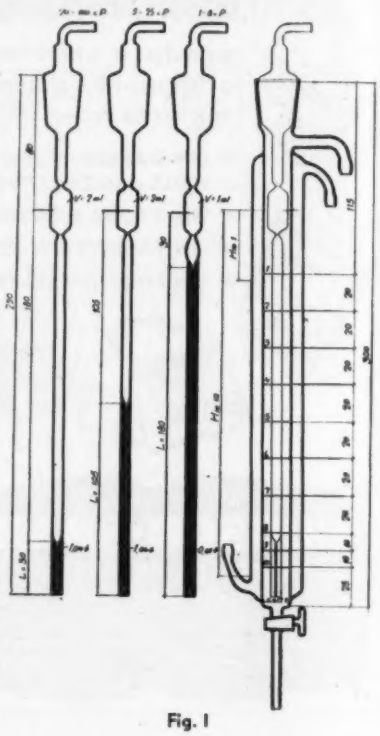

Fig. 1

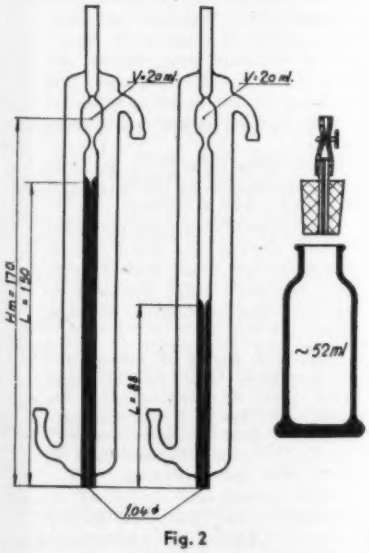

Fig. 2

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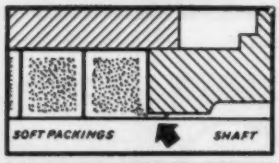
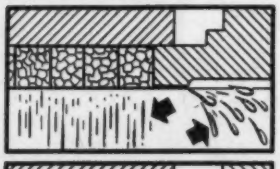
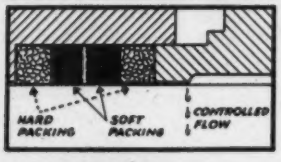


Straight soft packing used throughout permits end rings to squeeze into gland and throat clearances, thus sealing off the required amount of leakage needed to serve as lubricating film between shaft and packing.



Straight hard packing used throughout often is not sufficiently sensitive to gland pressure to control leakage within the desired limits. Also, the use of this single type of packing may result in scoring the shaft.



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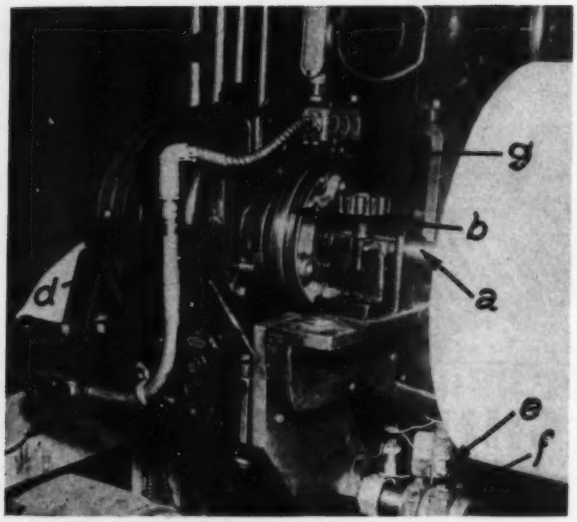
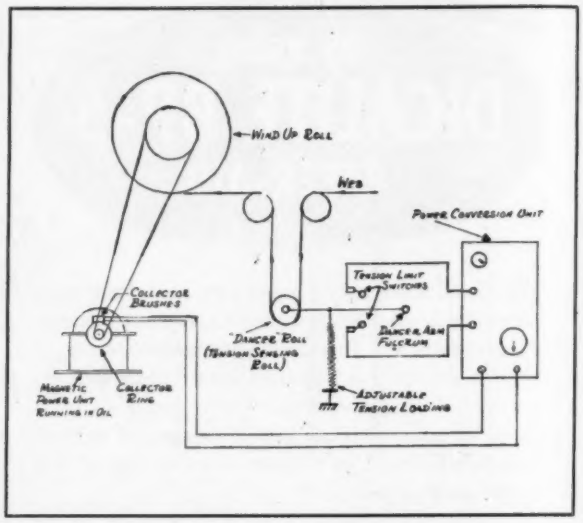


(a) Web shaft, (b) collector ring, (c) oil immersed magnetic clutch, (d) drive from parent machine, (e) dancer roll limit switch, (f) dancer roll fulcrum, (g) collector brushes



Schematic sketch of automatic windup tension control for maintaining constant tension and speed

Automatic tension control

The usual tension control consists of the conventional loop of the web or filament passing over two rollers and around a third on the end of a lever called a dancer arm, or similar arrangement. Tension is applied to the dancer arm by an adjustable spring or weight, or combination of both, and transmitted to the loop by the dancer arm roller.

As the dancer arm, by the loading, is forced up or down by the web, it actuates a voltage control which automatically makes intermittent corrections required to maintain the constant tension for which the unit is set. An adjusted value of low voltage dc current is fed into an oil-immersed electro-magnetic brake or clutch, depending on whether it is applied on an unwind or a windup. The "oil shear" provides the light tensions, while friction is used for heavy duty. Oil also provides the cooling medium; therefore, the friction co-efficient remains the same. In a continuous web machine no adjustments have to be made unless the product or the tension requires a change. Applications without dancer rolls, where tacky materials are handled, are also possible.

The device is suitable for high or low-speed operation, tensions being adjustable from zero to several pounds per inch of web width. Sizes are available for tensions requiring torques up to 1800 ft.-lb. If operated at near zero tension, it becomes a so-called tensionless drive. This unit will maintain constant lineal speed regardless of the size of the roll being wound or unwound. Special units have been designed for higher torques and for explosionproof applications in hazardous locations (subject to insurance underwriters approval). *Cadgene Machinery Co., Inc., 75 McLean Blvd., Paterson 4, N.J.*

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Precision ohmmeters, models 244A and 246A, master the problem of change in internal resistance in batteries due to aging and are, therefore, capable of high accuracy.

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Features of both instruments include: compensating circuit for changes in internal resistance of batteries; compensation for lead and clip resistance; accuracy to plus or minus 1/32 in. at any point on scale or ½ per cent at center scale; hand-stepped scales; built-in standard resistor for calibration check; and calibrating resistors wound to ½ per cent accuracy within temperature limits of —30 C. to 70 C. *Associated Research, Inc., 3758 W. Belmont Ave., Chicago 18, Ill.*

Proportioning weir tank

A new line of Omega proportioning weir tanks for solutions or suspensions has recently been introduced. These devices consist of a specially constructed tank incorporating a stilling chamber, an accurately machined rectangular weir, two outlet chambers and a flow splitter, so arranged that the total flow of solution or suspension to the two outlets can be readily divided into any proportion.

The flow splitter is graduated into per cent of total flow, is instantly adjustable, and has no moving parts. It may be fitted with a pneumatic or electric operator. *Omega Machine Co., 345 Harris Ave., Providence 1, R.I.*

Centrifugal sump pump

Improved models of Warren-Quimby VS and VN sump pumps are now on the market. These pumps are available in wet and dry pit types and are adapted to handling clear liquids, sewage and other liquids containing solids. They may be obtained in sizes from 1½ in. to 8 in., with capacities to 1000 gpm and pressures up to 250 psi. *Warren Steam Pump Co., Inc., Warren, Mass.*

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BUFFALO 11, N.Y.

and line. Its simple control reduces maintenance and down-time for accessory servicing. The vaporizer is easily disassembled by the removal of one set of bolts, thus permitting convenient steam cleaning and washing of interior parts. *The Whitlock Mfg. Co., Hartford 10, Conn.*

Motor control center

A completely new motor control center for use wherever two or more ac motors (up to 200 hp, 600 volts) are controlled from a central location has recently been announced.

The new center, pre-engineered, factory wired and assembled and employing many standard components and accessories, is designed to withstand short circuit stresses up to 25,000 amperes, substantiated by certified laboratory tests. Its sections, each measuring 20 in. deep, 20 in. wide, and 90 in. high, join together to form a strong, free-standing, completely dead front, NEMA I enclosed, control assembly.

It provides a simplified method of installing and servicing in a central location ac combination motor starters in NEMA sizes 1 through 5, as well as lighting panels and associated equipment for a group of motors.

One of the main features is a 4-inch vertical trough (with cable supports) which runs the full length of each section providing ample space for wiring. No "threading through" or "fishing" is necessary because metal barriers which separate the starter units are easily removed, leaving a continuous wiring trough.

Inspection and servicing of the starter units is simplified because the units are easily removable and all components, including pilot devices, are mounted on the lightweight unit frame. Units may be installed from the front or rear of the section and are designed in even multiples of 14 enabling a variety of arrangements to be made and providing easy interchangeability. Speed latches lock starter units into position. *General Electric Co., Schenectady 5, N. Y.*

Electro-oiling system

The new single line gravity feed electro-oiling system, Style DEI, is entirely automatic in operation. It consists of a central reservoir with a solenoid operated shut-off valve and a number of individual valves mounted directly into the bearings. Copper tubing connects the reservoir and all valves in series in such a manner that gravity flow will be maintained.

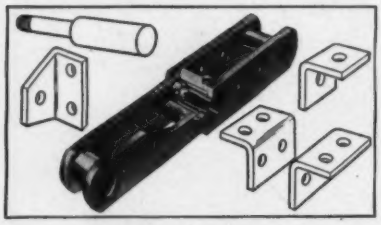
This system is used on applications where points to be lubricated are far apart. It simplifies the piping because only a comparatively small amount of tubing is necessary. It can be accommodated where space limitation is a problem, and because of its flexibility, can be used on many types of installation. *Oil-Rite Corp., 2395 Waldo Blvd., Manitowoc, Wis.*

Overload release

An overload release for the Dodge torque-arm speed reducer has recently been developed. Designed to prevent breakdowns, avoid expensive repairs, and insure against interruptions of production resulting from any excessive load on the equipment, the new product has been named the Dodge Tri-Matic overload release because of the triple protection which it affords. The release operates both mechanically and electrically to loosen the belts, cut off the cur-

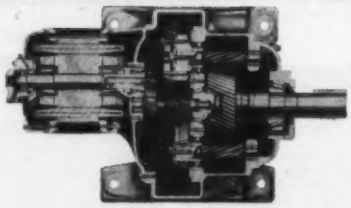
rent, and activate a warning bell, siren or light.

The Tri-Matic is calibrated for adjustment to the load conditions of any job and can be set to act at any desired load up to the reducer's maximum capacity. This new unit replaces the standard torque-arm that is regularly furnished with the speed reducer; the two are interchangeable. The Tri-Matic is available in sizes for all Dodge torque-arm speed reducers in either single or double reduction series. *Dodge Mfg. Corp., Mishawaka, Ind.*



Conveyor chain

Acmor type HP (hollow pin) chain is now available in either a steel roller or bushing type in 2, 2½, 3, and 4-in. pitch. Stock attachments are available for all pitches which are either bolted or welded to the chain proper, making it possible for the first time to construct an unlimited variety of conveyors from chain and attachments that can be carried in stock. Type HP chain is available on special order in various strengths and pitches up to 12 in. *Acmor Conveyor Chain Co., 17700 Broadway, Bedford, Ohio.*



Motor

Through triple reduction gearing in the new Type GM Syncrogear, a high torque, low-speed motor capable of ratios up to 175:1 is now being offered. By the use of two secondary pinions driving the output gear, the effective torque rating is doubled. The load is distributed equally between the two pinions by a splined herringbone pinion. Consisting of a motor with torque multiplying, built-in gearing, the Type GM Syncrogear motor greatly reduces the amount of space necessary to house this type drive.

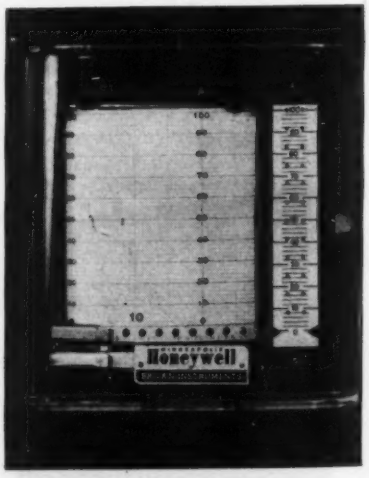
Available in 1 to 10 hp, with speed ranges of 5 to 25 rpm, the Type GM possesses normalized castings, asbestos-protected windings, solid centricast rotor and Lubriflush lubrication. *U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.*

Electrostatic electron microscope

A new electrostatic electron microscope with a resolving power of 30 a.u. has been developed. The operation of this instrument has been simplified to that comparable with an ordinary light microscope. Service and maintenance requirements have been greatly reduced, thereby making it possible to be used by less skilled technical personnel.

Among the many features of this microscope are: freedom from astigmatism, ease of alignment, distortionless image at all magnifications, consistent high image quality at direct magnifications up to 20,000X, large area viewing screen, built-in camera arrangement without air lock, etc. The instrument is adaptable for electron diffraction techniques and stereo electron micrographs. *Farrand Optical Co., Inc., Bronx Blvd. & E. 238th St., New York 70, N.Y.*

Tel-O-Set Controller



Tel-O-Set Recorder

Controller

For use with the components of a new integrated control system for flow, Honeywell engineers have developed the Tel-O-Set controller, a low-cost, easily installed, compact unit. Some of the features of this controller are: good sensitivity, instant response to process change, and a pneumatic balance principle of operation to eliminate friction and lost motion. Two types of controller are available—the fixed proportional band and the adjustable proportional band.

When a record of the process variable such as temperature, pressure, liquid level,

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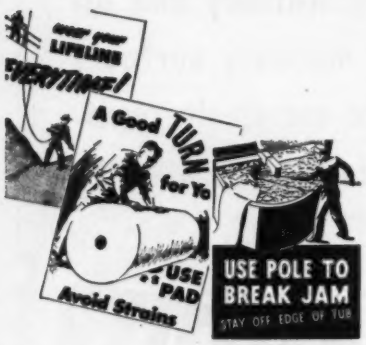

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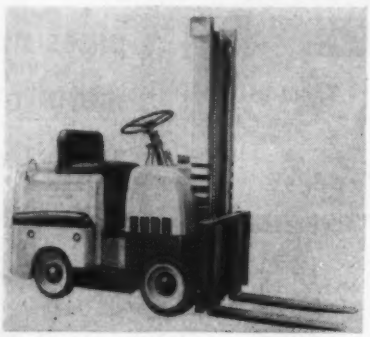
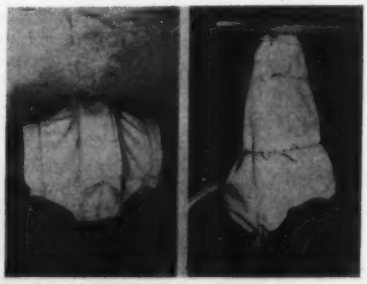
and flow is desired, the Tel-O-Set recorder can be used. This is a miniature recorder, so compact as to permit its use on graphic panels for recording all key-point variables. *Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44, Pa.*



Fork lift truck

The Buda FT series of fork li. trucks is completely new from the ground up and embodies the latest advancements in engineering, styling, accessibility and operating work performance.

The new "safelined" designed FT series of fork lift trucks, powered with either a diesel or gasoline engine, are available in 12 models on solid or cushion tires, in many capacities. Special features include: all roller construction mast with special rolled mast channels; two speeds forward and two speeds reverse single lever gear shift; quick change heavy-duty clutch; complete complement of electrical gauges on full front vision instrument panel; carriage mounted on patented adjustable side thrust rollers to reduce wear; accessibility of all parts for maintenance and servicing, and standardization and interchangeability of parts between all 12 models. *The Buda Co., Harvey, Ill.*



Valve and flange covers

Designed to provide protection against leakage without hindering normal operation, new valve and flange covers called Chem-Kovers are made of Dynel, a staple, untreated fabric which is highly resistant to acids, as well as caustics, easily cleaned, and will not support combustion. These covers are said to have sufficient strength to contain sprays resulting from gasket or packing failures in pressurized lines. Made to fit all styles and sizes of valves and flanges, they require no special tools to install and can be removed when lines require repair. *Mine Safety Appliances Co., Braddock, Thomas, and Meade Sts., Pittsburgh 8, Pa.*

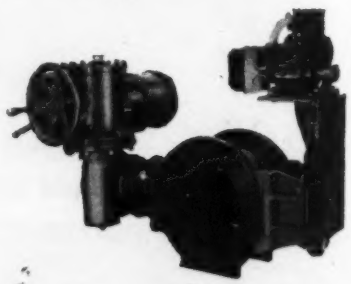
Steam trap

The new Universal Velan by-pass steam trap is specially designed for the processing industries where continuous uninterrupted operation is essential. Two special valves are incorporated in the trap and have a unique signalling device indicating even to an unskilled operator in which position the valves are. The draining device can be completely closed, steam and condensate can be by-passed and all internal parts of the steam trap replaced, or the condensate lines can be cleaned with live steam from alkaline deposits, scale and other matter.

The complete unit weighs 16.2 lb. It can be installed in any position, and one type can handle pressures from 0-350 psi. *Velan Engineering Co., 1 Exchange Place, Jersey City, N.J.*

Rosin size

A new grade of fortified rosin size for the paper industry called Dry Pexol, Grade 240, has recently been developed for use in unbleached, semibleached, and colored papers and boards. This new size gives, for the first time in fortified sizes, the economies of low brightness rosin. *Hercules Powder Co., Wilmington, Del.*



Valve

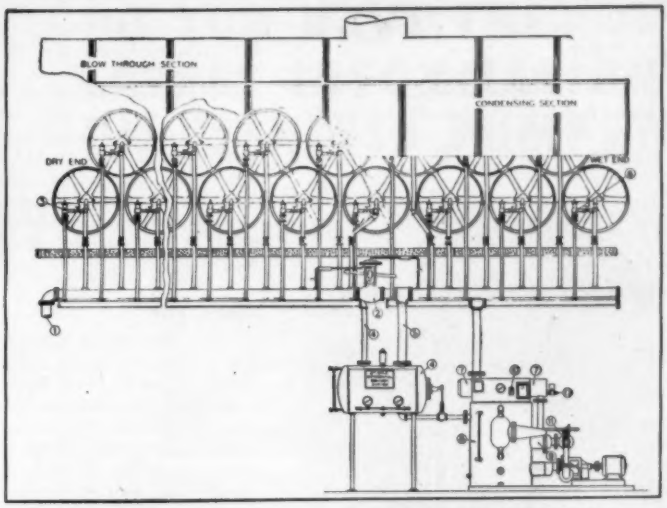
The 125-lb. cast-iron valve, No. 818, consists of a 12 in. beveled vane which seats against the body side wall with a 4 in. vane mounted in the center of the larger vane. It is equipped with 18-8 shafts, bronze bushings, and two lubricated stuffing boxes with two outboard bearings. Both vanes are motor operated.

The vane is employed in a turbine bypass line for controlling the required quantity of water when the turbine is not in use or when it is operating at reduced capacity. Designed for either a high-pressure drop and small volume or a low-pressure drop and large volume, this type valve is frequently furnished with a small free revolving vane. It is available in various combinations of sizes and for elevated or subzero temperatures, either manual or automatic control. *R-S Products Corp., 4600 Germantown Ave., Philadelphia 44, Pa.*

Automatic program controller

The new automatic program controller is a device for controlling the feed of chlorine at predetermined rates for predetermined periods in identical cycles to meet variations in chlorine demand as they may occur. The controller consists of a simple, cam-operated pressure valve so arranged as to transmit varying pressures to the lower diaphragm pressure chamber of the chlorine control valve in a chlorinizer. The cams are inter-

New Stickle Vacuum Differential Drainage Cuts fuel costs 10 to 15%



Installed, as above, the new Stickle Vacuum Differential Drainage employing improved Stickle Vacuum Pump, boosts production—cuts costs.

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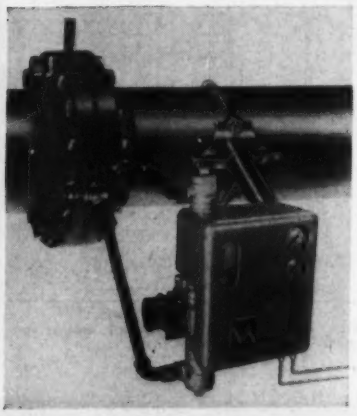
changeable with ease to meet the many variables encountered in chlorine demand and dosage.

All of the major elements in the program controller are self-contained in a dustproof case for panel, wall, or floor stand mounting. *Builders-Providence, Inc., 345 Harris Ave., Providence 1, R.I.*



Orifice metering

An entirely new approach to orifice metering has been introduced to industry. Instead of measuring the static-pressure differential across the orifice (as do conventional mercury manometers), a new unit, known as the V/A Cell, meters a continuous by-pass stream around that orifice.

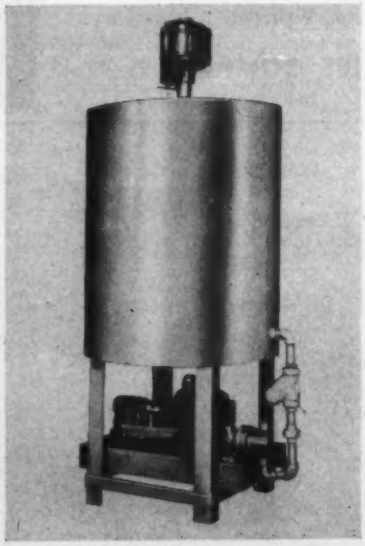
Four characteristics of this new approach to orifice metering are: kinetic action; linear relationship between the metered by-pass flow and the main flow past the orifice; simple adjustment of the by-pass rate to give the unit great flexibility, and adaptability to pneumatic connection to points remote from the orifice run.

In the pulp and paper industry, these characteristics mean much improvement in air, water, steam and thin liquor metering. Lead-line clogging is reduced and the need for steam condensate pots eliminated. The wide rangeability and the flexibility provided by simple replacement of the by-pass restriction (the range tube) offers new versatility in instrumentation. Further, the compactness of the unit, the point-of-measurement flow-indicator and the pneumatic activation of devices at remote points and panels permits greater freedom in piping and plant layout. *Fischer & Porter Co., Hatboro, Pa.*

Conveyor

Extra light and of high capacity, a new conveyor known as the Load-Veyor is designed to handle heavy loads. This 12 in. wide heavy-duty conveyor is made in 5-ft. and 10-ft. sections with 45-deg. and 90-deg. curves. Ball-bearing wheels with a 2-in. diameter and ⅜ in. wide are spaced on slightly less than 3-in. centers. This conveyor is available with welded-on connectors which are inter-connectable with the majority of other wheel conveyors of the same size. It can also be supplied with removable-type connectors.

The Load-Veyor is rated to take loads of 1000 lb. covering the surface of the conveyor and for individual loads up to 300 lb. per unit. *Market Forge Co., Everett 49, Mass.*

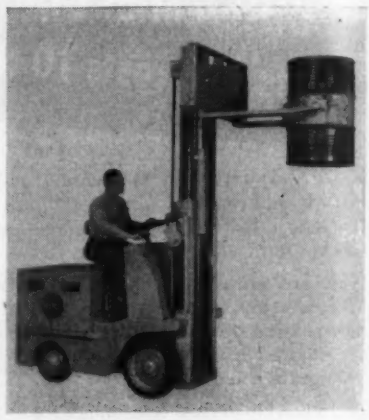


Chemical feed packaged unit

The new Bird-Archer chemical feed packaged unit, which delivers liquids in desired amounts under pressure, is ideally suited for feeding boiler water treatment.

This self-contained, extra heavy unit offers high pressure controlled feed at low cost. The chemical reservoir tank is of sturdy welded steel construction, available in 50 or 100-gal. capacity. The chemical proportioning pump can be designed for various rates of feed at different pressures. A specially designed motor-driven agitator completely mixes fluids at all times. A stainless steel strainer is provided between the suction side of the pump and the tank. The pump is mounted below the tank to minimize air binding and maintain a positive suction head.

A duplex pump model with divided tank is also available. Both types of units are supplied complete with all necessary piping and are ready for connection. *The Bird-Archer Co., 4337 N. American St., Philadelphia 40, Pa.*



Drum clamp

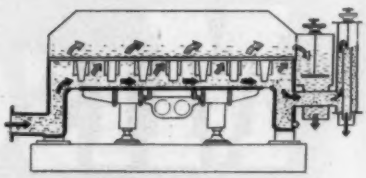
A new, improved version of the Baker drum clamp for fork trucks features retaining springs on the clamp's rubber-faced grab plates. These springs keep leading edges of the plates out of the way while drums are being positioned in the clamp. As the drum moves into position, grab plates close around it. Two shoes slip over and are pinned to the truck forks. Curved, rubber-faced grab plates are welded to the shoes.

By adjusting the distance between the truck's forks, using the fork-spacing feature of the Baker 4-purpose Carriage, truck operators can use the clamp attachment to handle drums of any standard size. *The Baker-Raulang Co., Industrial Truck Div., 1250 West 80th St., Cleveland 2, Ohio.*

Maintenance coating

The synthetic rubber, neoprene, is now being produced in a form which makes it eligible for maintenance work—for the exterior of tanks, process equipment, structural steel, pipelines, etc. The new material is not intended, like the older linings, for direct immersion in corrosive chemicals, but for protection against splash, spill and corrosive fumes and atmospheres.

This neoprene maintenance coating dries by solvent evaporation and cures by polymerization of the neoprene. *E. I. du Pont de Nemours & Co., Inc., 8545 Nemours Bldg., Wilmington, Del.*



Vibrating pulp screen

Recently acquired from Europe, where it has been used extensively in the pulp and paper industry, the Oliver-Ahlfors "Upflow" vibrating pulp screen has been further developed for use in the United States. This screen is particularly suited for primary and

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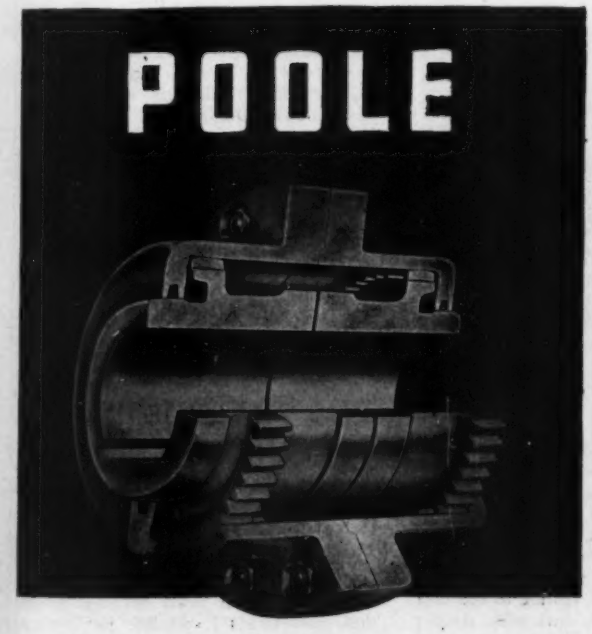

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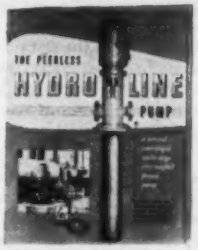

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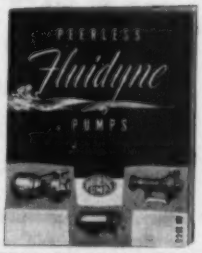

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secondary screening of all types of bleached and unbleached pulps.

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Motor backstop

A new method of preventing reversal of U.S. vertical hollowshaft motors has recently been developed. Hardened steel balls, the geometric form best suited to provide quick engagement and maximum strength, are used in this method employed in the Ballomatic backstop.

When the motor starts, centrifugal force throws the hardened steel balls out of engagement with the stationary member. When the motor stops, gravity pulls the balls down and one of them engages between the rotating member and the stationary ratchet, thus preventing reversal.

The backstop is designed with a different number of balls and ratchet flutes which multiplies the possible number of locking positions in one rotation, thereby reducing impact and resultant wear to the minimum. *U.S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif.*

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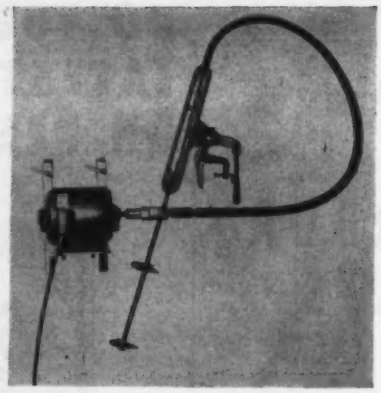
obsolete machines, tools and equipment, no-longer-used jigs and fixtures, worn-out or broken chains, wheels, pulleys, gears, pipe, tanks, drums and abandoned metal structures. Non-ferrous is needed, too!

The Paper Industry



Portable mixer

A new type portable mixer of extraordinary lightness and portability is now on the market. Designated as "Pie-Flex," the mixer is designed with separate motor coupled to the propeller shaft by a flexible drive shaft specially designed for agitator service. Mixer, drive shaft, and motor are quickly and easily detached for carrying separately.

Removal of the motor from its customary place at the top end of the propeller shaft makes the mixer much easier to handle, mount in place and adjust to the desired angle. Adjustment of the angle is facilitated by a lever-operated positioning device by which the mixer can be quickly positioned and locked in place without tools. Any standard horizontal motor can be used. *Process Industries Engineers, Inc., Pittsburgh, Pa.*

Water filter

A rotary, self-cleaning, gravity-type filter, designed specifically for the pulp and paper industry, permits fine screening of raw intake water, hot pond or cleanup water. Built in four different sizes, it is adaptable to many applications. Some of the additional features are: all units can be supplied with a special phenolic-resin coating to add acid and alkali resistant properties to the metals; special small cast iron end frames can be supplied for fitting into concrete pits; perforated plates can be supplied around the cylinder instead of wire mesh for some applications; any size mesh wire can be furnished in any material; shower hood covering the cylinder can be fabricated for special installation. *Green Bay Foundry and Machine Works, Green Bay, Wis.*

New Products Briefs . . .

SPARE PARTS KIT—To ease the problem of stocking spare parts for Life-Linestarters, kits containing complete sets of normal wearing parts—replacement moving contacts, moving contact springs, and stationary contacts—are now available. *Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.*

BEARING MATERIAL—Rulon, recently developed low-friction bearing material, is offered for testing commercially. Expectation is that the new material will find wide industrial application, as it requires no lubrication and will outperform currently available plastic, metallic and other bearing materials. It withstands temperatures up to 500 F., is chemically inert, and cannot be attacked by any process material. *Dixon Lubricating Saddle Co., Dept. No. 89, Bristol, R. I.*

BELT TRAINER—This new belt trainer, which automatically keeps wandering conveyor belts aligned, eliminates wear, down-time, and excessive maintenance costs caused by creeping belts. It can be installed on any make of conveyor which has the return belt exposed beneath the bed, and is designed for use on fabric or rubber-covered belts 3/16 in. or more thick, operating at speeds up to 200 fpm. *The Rapids-Standard Co., Inc., Dept. BT, 342 Rapistan Bldg., Grand Rapids 2, Mich.*

VINYL PRIMER—Specifically developed for use on rusted steel surfaces without the necessity for previous preparation, a new vinyl primer called Tygorust is easily applied by brushing, spraying, or dipping. It dries hard and can be overcoated in a few minutes. The primer adheres to rusted steel, damp or dry, and can be used with any type of finish coating, particularly vinyls. *U. S. Stoneware Co., Akron, Ohio.*

ACRYLIC THICKENERS—Polyco 296BT and Polyco 296N acrylic thickeners are aqueous solutions of sodium polyacrylate. They are water-soluble anonic colloids furnished as straw-colored, homogeneous solutions containing 15 per cent solids. Polyco 296BT is a high-viscosity grade and Polyco 296N is a medium-viscosity grade. *American Polymer Corp., Peabody, Mass.*

ACID SAFETY GOGGLE—Lightweight Duo-Chem acid goggles have a vinyl frame which is resistant to acids and alkalies, easy to clean and long-wearing. The one-piece lens is made of special acid resistant optical plastic that will not stain or discolor and can be removed and replaced without the use of tools.—*United States Safety Service Co., Kansas City 6, Mo.*

CONSOLE DESK—A newly designed console desk now makes it possible for a single operator to obtain plant temperature readings up to 96 processing points. It is a 60-inch-wide executive-type office desk arranged with cutouts to accommodate an ElectroniK precision indicator and key switch banks or push-button assemblies. *Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.*

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The Paper Industry New Literature

Books

PAPER AND PAPER MAKING. By F. H. Norris. Published by Oxford University Press, 114 Fifth Ave., New York 11, N. Y. 353 pages. 6 x 10. $6.00.

This book, containing many photographs and diagrams, is a modern authoritative work on paper manufacture in easily readable form. It is intended to serve both as a textbook and reference book for those engaged in all branches of the papermaking industries.

Beginning with a brief history of papermaking, the book goes on to describe the derivation, physical characteristics and general usage of principal paper-making fibers. The major part of this volume gives a detailed description of the various processes of papermaking, while the final section deals with the methods of assessing the quality and various properties of paper.

Also included are a glossary of paper and board qualities, a dictionary of trade terms, and a glossary of paper, board, book and stationery sizes. Appendix I presents useful calculations and tables of paper and board sizes with equivalent weights, and Appendix II gives the text of the British Paper Trade Customs, 1949.

SELLING TO INDUSTRY. By Bernard Lester. Published by The Industrial Press, 148 Lafayette St., New York 13, N. Y. 255 pages. 4½ x 6⅞. $3.50.

Written in the form of short easy-to-read articles which are grouped in thirteen sections, this book is a manual of practical ideas and suggestions for the sales engineer who wants to analyze and improve his methods of finding, contacting, selling and servicing industrial customers.

In this manual the author has set forth briefly those key points which have, from experience, been found to be most effective.

FOREST INVENTORY. By Stephen H. Spurr. Published by The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. 476 pages. 6 x 9. $8.50.

This book is a comprehensive report which reassesses the theory and methods of present day forest mensuration. The objective is to assist practicing foresters, and all others who have a special interest in forest mensuration, in the development of simpler and more accurate methods of correlating forest volume and growth with measurements made on aerial photographs and on the ground. The book is adapted for use as a text in graduate courses and seminars on forest mensuration.

The discussion emphasizes the problems of estimation of the volume of individual trees, direct estimation of stand volume, and the prediction of stand growth. At all times, the necessity for simplicity and for low-cost techniques has been kept in mind. The treatment covers the essentials of all previous research in forest mensuration, plus the results of the author's own investigations. The bibliography represents the first compilation of original material in forest mensuration to appear in any language. Many forest agencies, both in this country and abroad, have made their data available in this study.

Booklets and Pamphlets

REPORT OF THE THIRTY-SIXTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES. Published by the National Bureau of Standards, U. S. Department of Commerce, Washington 25, D. C. (Publication 202). 115 pages. 50 cents. Covering the six sessions of the Thirty-Sixth National Conference on Weights and Measures, this publication reports the entire proceedings of the Conference and lists the officers, committees, and persons attending. It also notes plans for the Thirty-Seventh Conference. Texts of a number of addresses are included, among them reports from various Conference committees. (Order from Government Printing Office, Washington 25, D. C.)

CATALOGUE OF PUBLICATIONS. Published by Forest Products Research Society, P. O. Box 2010, University Station, Madison 5, Wis. 12 pages. Of interest to all producers and users of wood and wood products, this catalogue lists over 200 individual publications of the Society by subject matter, as well as by year of issue. It describes contents of five Annual Proceedings issues and the first volume of the new Journal of the FPRS.

WATER CONDITIONING DATA BOOK. Compiled by The Permutit Co., 330 West 42nd St., New York 36, N.Y. 116 pages. 4¾ x 7. Brought up to date and completely revised, this new data book presents a compilation of 77 tables, all valuable to the engineer. Some of the subjects covered are: hydraulics, impurities in water, boiler feedwater make-up requirements, chemical conversions, and chemical reactions. It is available to practicing engineers and those who work with water conditioning problems.

CATALOGUE OF PUBLICATIONS. Published by Forest Products Research Society, P.O. Box 2010 University Station, Madison 5, Wis. 10 pages. 5½ x 8½. This pamphlet lists reprints available from the FPRS for the years 1947 through 1951, in addition to a short description of the Annual Proceedings of the FPRS for these years.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Knife Grinder. Samuel C. Rogers & Co., 183-205 Dutton Ave., Buffalo 11, N. Y.—6-page Bulletin 220 describes the operation of the massive series 220 heavy-duty knife grinder, giving full specifications. It is illustrated with cuts showing the grinder, adaptations and features.

Servomechanism Techniques. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—"Servomechanism Techniques in Modern System Engineering" is the title of this new 24-page booklet, No. G-56. Basic information is given on a new approach to the analysis of automatic control problems in industrial process instrumentation. Advantages of this method to both the user and manufacturer of instruments are described.

Handling Operation. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.—Job Study No. 111, based on Towmotor operations in a leading transfer terminal, describes savings made possible by streamlined handling methods.

Temperature Controls. Fenwal Inc., Ashland, Mass.—A new 52-page, catalog (No. 400) describes the design, operating characteristics and installation of each of the 10 variations in the basic Fenwal thermostatic device. A special section concerning the selection and application of the Thermoswitch is given. It is illustrated with many helpful drawings, photos, graphs and tables.

Color Guide. Sigmund Ullman Co., Div. of Sun Chemical Corp., 10th St. and 44th Ave., Long Island City 1, N. Y.—This Standard Color Guide shows 48 full strength colors printed in a solid and screen values. Also shown are 20 popular tints made from transparent formulas.

Fan-Cooled Motor. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Designated as No. 51B7149B, this bulletin describes construction features and details of Allis-Chalmers totally enclosed, fan-cooled motors with tube-type, air-to-air heat exchangers in ratings from 40 hp at 600 rpm through 800 hp at 3600 rpm. Included are both standard and explosion-proof designs.

Color Control. American Cyanamid Co., Calco Chemical Div., Bound Brook, N. J.—Designated as Technical Bulletin No. 824, this paper "Color Control in Paper Making," by David B. Snedeker, enumerates the many factors which may influence the color of the final sheet and makes suggestions for controlling these factors to assure uniform results.

Mixers. Mixing Equipment Co., Inc., 200 Mt. Read Blvd., Rochester 11, N. Y.—This new 32-page catalogue (B-102) describes turbine-type Lightnin mixers for open and closed tanks and contains a factual discussion of fluid agitation. Many photographs, diagrams, and tables are included.

Crane Trucks. Baker-Raulang Co., Industrial Truck Div., 1250 West 80th St., Cleveland 2, Ohio.—6-page Bulletin 1618 describes Baker model CXB and CXF locomotive-type

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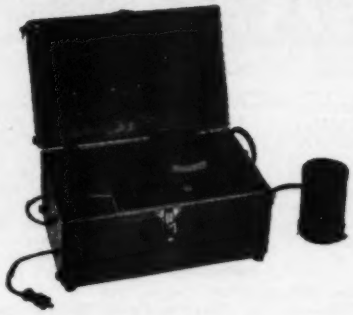

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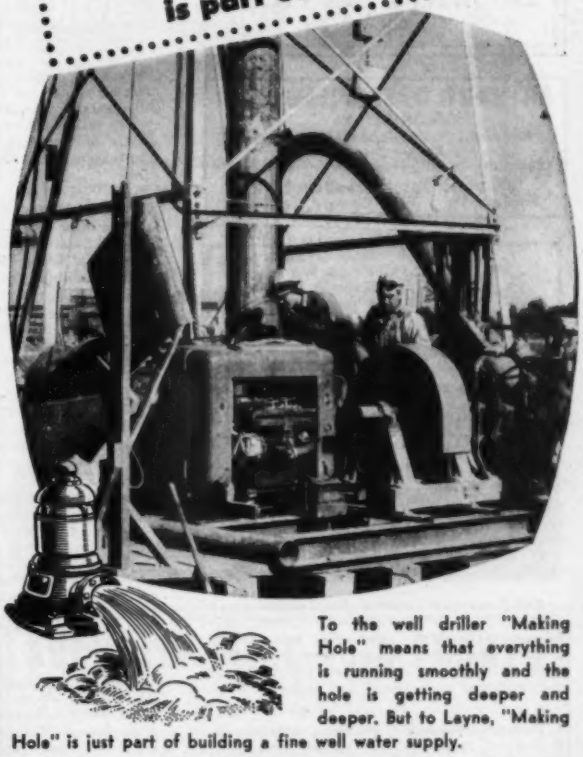

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crane trucks. Cutaway photos of component parts are used to make construction details easy to follow. Complete engineering specifications and drawings are also included, along with action photographs that show these trucks at work in a variety of applications.

Belt Conveyor Carriers. Stephens-Adamson Mfg. Co., 274 Ridgeway Ave., Aurora, Ill.—18-page Bulletin 2-C describes many standard and special belt conveyor carriers. Photographs, diagrams, and dimension tables are included.

Rotary Sulphur Burner. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.—Instrumentation Data Sheet 2.9-20a discusses the application of instrumentation to rotary sulphur burners. Drawings, installation photographs, and an explanation of the advantages gained from carefully engineered instrumentation are included. Also described in detail is the method of the Superior automatic SO_2 analyzer.

Enclosed Motors. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis.—Advantages and limitations of totally enclosed motors with air-to-water heat exchangers are related in the 4-page Bulletin 05B7682. Included is a description of the three types of cooler arrangement built into the motors and an explanation of how to estimate their water requirements.

Telemeters. Builders-Providence, Inc., 409 Harris Ave., Providence 1, R. I.—This 8-page bulletin (No. 230-H4) describes the Chronoflo telemeter. It lists the many features of the device, describes the operation of the transmitter and receiver, and shows photographs and diagrams to illustrate the mechanism and installations. The bulletin also describes the many applications of the telemeter.

Valves. The Cooper Alloy Foundry Co., Hillside 5, N. J.—This 8-page booklet entitled "How to Get What You Need When You Order a Valve" describes many of the pecularities encountered in the relationship between companies and suppliers of the equipment they use. Information necessary to enable the manufacturer, supply company or sales representative to fit the proper valve for the application at hand is discussed in detail.

Fans and Blowers. Standard Electric Mfg. Co., West Berlin, N. J.—This 24-page catalogue lists a wide range of ventilating fans, air circulators, belt driven exhaust fans, floor and window fans, spray booth fans, and pressure and volume blowers. Complete specifications are given.

Cylinders. Crawford Inc. Engineering, 254 Aborn St., Providence 3, R. I.—The new "Drawlok" cylinder is described in a new, 4-page bulletin. A large drawing of the cylinder is given. Also included is a description of its operation, dimensions, and applications.

Filtration. Great Lakes Carbon Corp., Dicalite Div., 18 East 48th St., New York 17, N. Y.—This 23-page technical bulletin (B-12W) covers the use of diatomaceous filteraids in filtering water for reclamation and recycling in industrial processing, prevention of pollution in waste disposal, and purification of domestic and industrial potable supply. One section is devoted to filtration of paper mill white water.

Oscillating Conveyors. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—This new 24-page illustrated Book No. 2444 on positive action oscillatihg conveyors for conveying, feeding, cooling, and screening a great variety of loose bulk materials includes dimensions, weights, and capacity and horsepower charts on Torsion Mount oscillators for heavy duty, as well as for the Flexmount oscillator for lighter-duty applications.

Flow Meters. Fischer & Porter Co., 5580 County Line Rd., Hatboro, Pa.—Flow meters and indicators are described in this illustrated bulletin. Full specifications, capacities, sizes, and dimensions are given.

Conveyor and Elevator Belting. New York Belting and Packing Co., 1230 Avenue of the Americas, New York 20, N. Y.—This new catalogue on conveyor and elevator belting gives all the necessary data to lay out a drive or specify a belt. Complete tables on carrying capacities, horsepower factors, pulley diameters, maximum and minimum plies for proper troughing and other engineering information are included.

Non-Fusion Welding. Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing, New York, N. Y.—This 8-page reprint of a technical paper, "Dilution and Diffusion Aspects of Non-Fusion Welding" is profusely illustrated and documented with charts, diagrams, tables and formulae derivations.

Handling Equipment. Barrett-Cravens Co., 4609 S. Western Blvd., Chicago 9, Ill.—Designated as No. 5191, this bulletin illustrates and briefly describes the principal units in the comprehensive Barrett line of equipment for the floor level handling of materials.

Floors. The Wilbur & Williams Co., 130 Lincoln St., Brighton 35, Mass.—In this folder, industrial floor problems are analyzed and suggestions given for providing a walkaway surface that offers a high resistance to slipping under a wide variety of service conditions.

Stainless Steel Castings. The Cooper Alloy Foundry Co., Bloy & Ramsey Ave., Hillside, N. J.—"From Problem Castings to Production Jobs" is the title of an 8-page folder which describes in detail the methods by which intricate stainless steel castings were turned from problem castings into large-scale production jobs.

Air Conditioning Cabinets. Buffalo Forge Co., 490 Broadway, Buffalo, N. Y.—This 40-page engineering bulletin (3703A) describes the new Buffalo Model "G" air conditioning cabinets. Included are capacity tables, diagrams, charts and detail photos.

Demineralizer. Penfield Mfg. Co., Inc., 19 High School Ave., Meriden, Conn.—This new catalogue sheet gives a concise description of Penfield's Mono-Bed demineralizer. Included are a picture of the unit, a diagram with parts lettered and identified, a description of the parts, a specifications chart, and a performance chart.

Wire Cloth. Multi-Metal Wire Cloth Co., Inc., 1350 Garrison Ave., New York 59, N. Y.—This 125-page catalogue, No. 50, contains full listings and illustrations of wire cloth, filter cloth, pulp and paper mill wires and fabricated products, in addition to an engineering section, a research section, and a technical data section, giving it the value of a handbook. Highlighting the research section is a report on 18 months of research into the flow characteristics and particle retentivity of metallic filter cloths, conducted at Columbia University in New York by special arrangement with this company.

Gravimetric Feeders. Omega Machine Co., 345 Harris Ave., Providence 1, R. I.—This 4-page bulletin (30-H12) describes the Loss-in-Weight gravimetric feeder for dry materials and discusses its operation, feeding range, vibratory feeding mechanism, synchronous motor feed rate control, and hopper mounted on a specially built Omega pipe lever suspension scale. Accessories described include a chart recorder, hopper agitators and dissolving chamber.

Electric Power Drives. Sterling Electric Motors, Inc., 5401 Anaheim-Telegraph Rd., Los Angeles 22, Calif.—Contained in this 20-page illustrated catalogue is complete descriptive information on variable speed drives, geared motors and constant normal speed motors in drip-proof, splash-proof, totally enclosed and pipe ventilated designs.

Flow Meters. The Bristol Co., Waterbury 20, Conn.—Bulletin No. F1606 describes the new Series 500 line of Bristol open channel flow meters. Included in the bulletin is a description of the application of the instruments to measurement of flow of water, sewage, industrial plant, effluent, irrigation water and other liquids through weirs and flumes of all types.

Corrosion Resistant Valves. Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.—This new 35-page service bulletin describes types, sizes, operation and features of Rockwell-built Nordstrom corrosion resistant valves, in addition to information on Nordstrom meters, lubricants and lubricant equipment. Tables are included listing approximately 175 different chemicals with their recommended alloy valves and lubricants. Over 100 photographs, sectional drawings, and dimensional drawings illustrate valve sizes, types and practical applications.

Beta Gauge. Industrial Nucleonics Corp., 1205 Chesapeake Ave., Columbus 12, Ohio—The use of the AccuRay Beta Gauge in the paper industry is described in this 4-page bulletin, R-D-52. In addition to an explanation of the features of the unit, a schematic presentation of basic AccuRay operating principles, plus a description of component parts, is presented. Graphs of actual production runs show how use of the AccuRay has enabled manufacturers to improve process control. Illustrations of gauge installations in various plants are included.

Stereomicroscopes. Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.—Fully illustrated with photographs and sketches of various models and accessories, this 20-page brochure also cites the many uses of the series' 14 models (formerly called Stereoscopic Wide Field Microscopes), whose three-dimensional features provides a magnified image which is both stereoscopic and unreversed.

Preventive Maintenance. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.—This 28-page booklet, B-5477, gives a complete outline of the successful institution of preventive maintenance programs for any industry. A suggested schedule of work and cleaning on power equipment is presented in chart form.

Germicides and Fungicides. The Dow Chemical Co., Midland, Mich.—Information about Dow's entire line of germicides and fungicides for mold and bacteria control is contained in this new loose-leaf folder. Typical applications in many industries are described. Physical and chemical properties of these industrial germicides and fungicides are also described.

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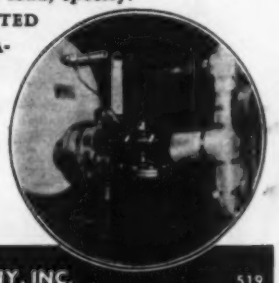

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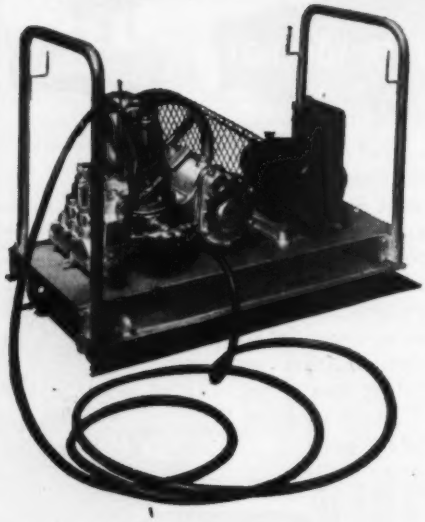

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New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.		
Roofing—			
No. 1	1.40	to	1.50
No. 2	1.00	to	1.10
No. 3 and 4	.85	to	.90
Twos and Blues—			
Repacked	3.25	to	3.50
Thirds and Blues—			
Repacked	2.75	to	3.00
Miscellaneous	2.25	to	2.50
Whites, No. 1—			
Repacked	6.25	to	6.50
Miscellaneous	5.25	to	5.50
White, No. 2—			
Repacked	5.00	to	5.25
Miscellaneous	4.25	to	4.50

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 3 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.		
Gunny No. 1—			
Foreign	6.00	to	6.25
Domestic	6.00	to	6.25
Wool Tares—			
Light	7.50	to	7.75
Heavy	8.00	to	8.25
No. 1 Scrap Bagging	5.25	to	5.50
Manila Rope—			
No. 1 large	9.00	to	9.50
No. 1 small	8.00	to	8.25
Sisal Rope—			
No. 1 large	7.50	to	8.00
No. 1 small	7.00	to	7.25
New Burlap Cuttings	8.00	to	8.50
Jute Threads—			
Foreign (Nom.)	8.00	to	8.50
Domestic	8.00	to	8.50
Strings—			
No. 1 sisal	6.00	to	6.50
No. 2 sisal	5.50	to	5.75
Soft jute	5.75	to	6.00
Mixed	4.00	to	4.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton		
Hard White Env. Cuts	135.00	to	140.00
Hard White, No. 1	110.00	to	115.00
Soft White, one-cut	90.00	to	95.00
Soft White, No. 1	80.00	to	85.00
Soft White, Misc.	65.00	to	70.00
Fly Leaf, No. 1	40.00	to	45.00
Fly Leaf, Woody No. 1	35.00	to	40.00
No. 2 Mixed Col. Woody	30.00	to	35.00
Flat Stock—			
No. 1 Heavy Books and Magazines, Repacked	36.00	to	38.00
Mixed Books	24.00	to	25.00
Ledger Stock—			
No. 1 White	60.00	to	65.00
No. 1 Mixed (Colored)	45.00	to	50.00
Manilas—			
New Env. Cuttings	80.00	to	85.00
New Env. Cuts, One-Cut	—		
Extra Manilas	40.00	to	45.00
Manila Tab Cards, Free of Ground Wood	80.00	to	85.00
Colored Tab Cards	55.00	to	60.00
Kraft—			
New Envelope Cuttings	70.00	to	75.00
Tripled Sorted No. 1 100%	42.00	to	45.00
No. 1 Old Assorted	27.50	to	30.00
News—			
White Blank	60.00	to	65.00
Overissue	17.00—		
No. 1 Folded	10.00—		
Old Corrugated Containers	13.00—		
New Jute Corrugated Cuts	18.00—		
Mill Wrappers	10.00—		
Box Board Chips	9.00—		
No. 1 Mixed Paper	7.00—		

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—			
Lump, cwt.	4.55—		
Ground, cwt.	4.80—		
Powdered, cwt.	4.70—		
Blanc Fixe—			
Pulp, bulk, ton	90.00—		
Dry, barrels	95.00—		
Bleaching Powder—			
Drums, cwt.	5.00	to	6.00
Casein (Domestic Standard)			
20-30 mesh (bags), lb.			
80-100 mesh (bags), lb.	27.50—		
Argentine, lb.	19.00—		
China Clay—			
Domestic Filler			
Bulk (mine) ton	16.00	to	18.00
Domestic Coating			
Bulk (mine) ton	18.00	to	23.00
Imported (ship side)			
Bulk (lump) ton	22.00	to	30.00
Chlorine—			
Tanks cars (wks) cwt.	2.70—		
Gelatine (silicin), lb.	1.25	to	1.35
Glyc. (C.P.) drums, lb.	54.25	to	54.75
Litharge, powd. bbl. lb.	20.65	to	21.65
Rosin (Gum)—	New York, per 100 lbs.		
E	8.50—		
F	8.50—		
G	8.50—		
WW	8.85—		
Rosin (Wood), carlots,			
F.O.B. South	4.90	to	5.00
Salt Cake—			
Dom. bulk (wks) ton	17.00	to	23.00
Imp. bulks on dock—			
(Atl. ports) ton (Nom.)	23.00—		
Soda Ash—			
Bulk (works) cwt.	1.20—		
Paper bags, cwt.	1.50—		

MARKET QUOTATIONS

Soda (Caustic)—
Solid drums, cwt. ..... 3.35 to 3.40
Ground and flake, drums, cwt. ..... 3.75 to 3.85

Sodium Silicate—
60 deg. 55 gal. drums, (works) cwt. ..... 1.70 to 1.80
40 deg. 55 gal. drums, (works), cwt. ..... 1.40 to 1.50

Starch—
Pearl, 140 lb. bags, cwt. 6.44—
Pearl, barrels, cwt. ..... 6.44—
Paper (Sp.) bags, cwt... 6.44—
Powdered, barrels, cwt... 6.65—

Sulphur (Crude)
(Mine) bulk, long ton.... 21.00 to 22.00

Talc—
Dom. 100 lb. bags (mine) ton ..... 25.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig. bbls., lb.... .21 to .21½
Calcium Pig. bbls., lb.... .21 to .21½
Zinc Sulphide, bbls., lb.... 11.50 to 11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite .....140.00—
Unbleached sulphite .....132.50—
Bleached sulphate .....145.00—
Semi-bleached sulphate .....140.00—
Unbleached sulphate 132.50
Bleached soda .....140.00—
Ground wood ..... 92.50—
Sulphite screenings ..... 72.50—
Sulphate screenings ..... 67.50—
Ground wood screenings..... 60.00—
Unbleached sulphate siderums .....132.50—
Standard news print siderun ..... 92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite .....225.00—
Bleached sulphate .....230.00—
Unbleached sulphite .....200.00—
Unbleached sulphate .....200.00—

PAPER

Boards—
OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:

Plain chip.....105.00—
News vat lined chip.....107.50—
Filled news.....110.00—
Solid news.....112.50—
White vat lined chip.....142.50—
Chip tube and can stock....110.00—
Single manila lined chip....147.50—
Single jute lined chip.....145.00—
White patent coated:
.020 .....175.00—
.018 .....177.50—
.016 .....180.00—

Book Paper—
OPS ceiling prices (CPR 106) per cwt.:

Coated two sides
70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides.... 4 cases $17.25 Carloads $16.30
45 lb. enamel, 25x38-500, trimmed 4 sides..... 4 cases $13.05 Carloads $12.10

Uncoated
55 lb. No. 2 offset, 25x38-500, trimmed 4 sides..... 4 cases $14.80 Carloads $13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed ..... 4 cases $14.05 Carloads $13.10
30 lb. envelope, 17x22-500, untrimmed ..... Carloads $12.40
16 lb. tablet, 17x22-500 ..... Carloads $11.35

Rag Content Bond—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag	57.50	58.50
100% rag	49.50	50.50
75% rag	38.00	39.00
50% rag	29.50	30.50
25% rag	24.00	25.00

Rag Content Ledger—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag	58.50
100% rag	50.50
85% rag	42.00
75% rag	39.50
50% rag	30.50
25% rag	25.00

Sulphite Bond—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked	16.50
No. 2, M.F. watermarked	15.90
Plain, M.F. unwatermarked	15.00

Glassine (f.o.b. mill)—
OPS base ceilings (CPR 76): per cwt.
25 lb. base No. 1 bleached glassine ..... 22.50—
25 lb. base No. 1 bleached greaseproof ..... 20.00—

News— per ton
Rolls, Standard (Contract) .....116.00—
Rolls (Spot)..... (Nominal)
Sheets .....130.00—

Tissues (Carlots)— per ream
White No. 1..... 1.90—
White No. 2..... 1.65—
Bleached Anti-Tarnish.... —
Colored ..... 2.00—
Anti-Tarnish Kraft..... 1.90—
Manila ..... 2.00—
Napkins, semi-crepe (12⅝ lb. to M shts.) per cs. ..... .90—
Napkins, full crepe and embossed (12⅝ lb. to M shts.) per cs..... .90—
Toilet, Bleached (M shts.) per cs..... 10.00—
Toilet, Unbleached (M shts.) per cs..... 8.00—

Towels per case
Bleached ..... 6.80—
Unbleached ..... 5.90—

Wrappings (Kraft)—
OPS ceilings, per cwt., 50 lb. base weight: per cwt.
Standard wrapping ..... 7.75—
Butchers, counter rolls..... 8.25—
Standard bag, mill rolls.... 7.50—
Shipping sack, mill rolls.... 7.75—
Gumming, mill rolls..... 8.00—
Asphalting, mill rolls..... 7.75—
Envelope, mill rolls..... 9.25—

Wrappings (Sulphite and Bleached Kraft)—(Rolls, f.o.b. mill)

Bleached Papers— per cwt.
M.F. & M.G. Waxing, 20 lb. (carloads only) (10,000 lb.)..... —
Drug wrapp., 35 lb.... —

Unbleached Papers
Com. Gr. Butch. 40 lb. —
No. 1 Butchers..... —
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb..... —
Steam Finish, 50 lb.... —
Water Finish, 50 lb.... —

Manilas—
Envp. Mla., Sub. 16-40 (No. 1)..... —
Env. Mla., Sub. 16-28 (No. 2)..... —
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.)..... —

Wrapp. Mla. 35 lb. up—
No. 1..... —
No. 2..... —

M.G. Sulphite and Kraft (other than Waxing)
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Grade A-22 lb..... —

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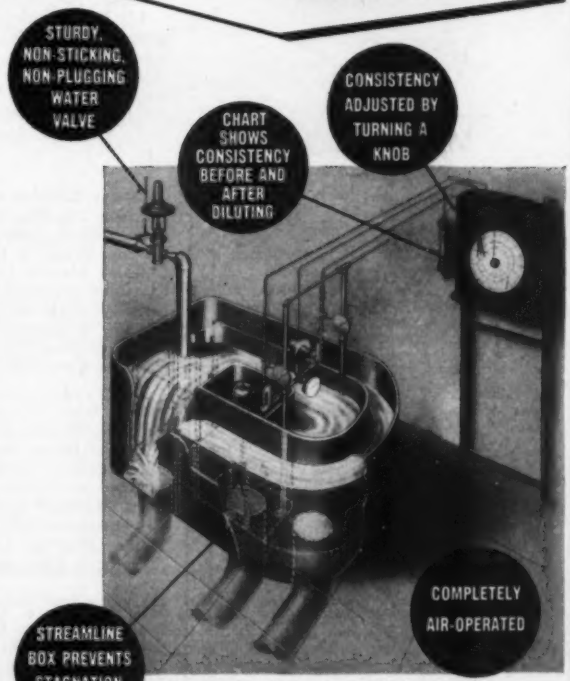
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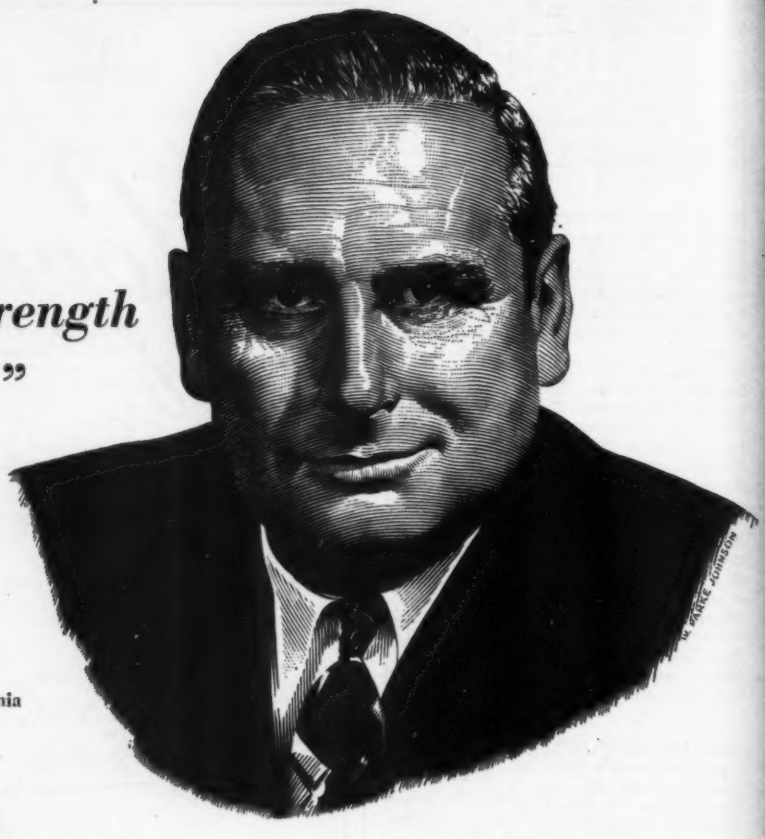

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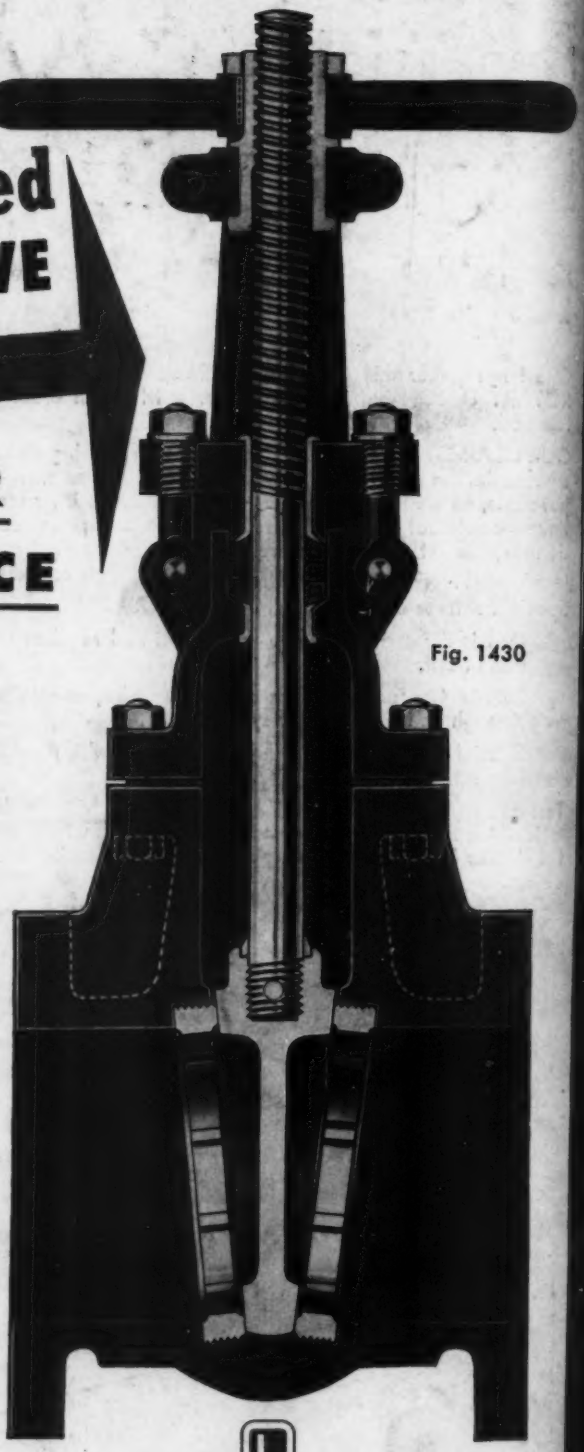

Fig. 1430

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Notice the generous body thicknesses, non-distorting bronze disc, modern end-seated seat rings, and the bonnet bushing which permits repacking under pressure. Ask your distributor about the other advantages of the Lunkenheimer Iron Body Bronze-Mounted line.

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WRITE FOR Circular 564, describing iron valves in detail, to The Lunkenheimer Company, Box 360S, Cincinnati 14, Ohio.

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